NEXT ANNUAL SESSIONS
California Medical Association, Riverside, April 30–May 3, 1934
American Medical Association, Cleveland, Ohio, June 11–15, 1934

MEDICAL LIBRARY

CALIFORNIA AND WESTERN MEDICINE

Owned and Published Monthly by the California Medical Association
FOUR FIFTY SUTTER, ROOM 2004, SAN FRANCISCO
ACCREDITED REPRESENTATIVE OF THE CALIFORNIA AND NEVADA MEDICAL ASSOCIATIONS

VOLUME XXXIX
NUMBER 6

DECEMBER · 1933

50 CENTS A COPY
$5.00 A YEAR

CONTENTS AND SUBJECT INDEX

SPECIAL ARTICLES:

Insulin-Free Pancreatic Extract and the Circulatory Hormone (Kallikrein of Frey and Kraut). By Franklin R. Nuzum and Albert H. Elliot, Santa Barbara 361
Discussion by H. O. Koefod, Santa Barbara; Hans Lisser, San Francisco.

Hyperpyrexia Baths and Epilepsy. By Helen Hopkins, Los Angeles..... 364
Discussion by Samuel D. Ingham, Los Angeles; H. Douglas Eaton, Los Angeles; Thomas G. Inman, San Francisco.

Carcinoma of the Colon—From a Roentgen Standpoint. By Carl B. Bowen, Oakland 368
Discussion by Kenneth S. Davis, Los Angeles; Robert R. Newell, San Francisco; Howard E. Ruggles, San Francisco.

Actinomycosis of the Kidney. By Theodore S. Kimball and Robert B. Haining, Los Angeles 370
Discussion by Verne C. Hunt, Los Angeles; Howard A. Ball, San Diego; Charles Pierre Mathé, San Francisco.

Clinical Tetanus. Part II. By Hyman I. Vener, A. G. Bower and J. E. McKillop, Los Angeles..... 374
Discussion by Willard J. Stone, Pasadena; Louis H. Jackson, West Los Angeles; Burrell O. Raulston, Los Angeles.

The Problem of Dysmenorrhea. By Ludwig A. Emge, San Francisco..... 380
Discussion by Clifford A. Wright, Los Angeles; John W. Sherrick, Oakland; Ruby L. Cunningham, Berkeley.

Bismuth Injections in the Treatment of Warts. By C. J. Lunsford, R. R. Thomson, G. W. Binkley and D. S. Fox, Oakland 385
Discussion by Sophie A. Lurie, Los Angeles; Samuel Ayres, Jr., Los Angeles; Stanley O. Chambers, Los Angeles.

Female Bladder Injuries Incident to Surgery. By William E. Stevens, San Francisco 388
Discussion by Robert V. Day, Los Angeles; Lionel P. Player, San Francisco; Harry W. Martin, Los Angeles.

Treatment of Neck Glands in Cancer of Lip, Tongue, and Mouth. By Otto H. Pflueger, San Francisco 391

Human Amebiasis. By Luther Musson Boyers, Berkeley 397

Carcinoma of the Breast—Its Roentgen Treatment. By J. M. Rehfisch and L. H. Garland, San Francisco..... 401
Discussion by Leo Eloesser, San Francisco; Orville N. Meland, Los Angeles; Alson R. Kilgore, San Francisco.

LURE OF MEDICAL HISTORY:

Fifty Years of Progress in the Prevention of Disease. Part II. By J. C. Geiger, San Francisco..... 406

CLINICAL NOTES AND CASE REPORTS:

Splenic Extract—Its Effect on the Calcium of Blood Serum. By John Ferguson, Edmonton, Canada..... 409

Santonin Poisoning. By W. A. Vinks and A. W. McArthur, Lincoln..... 409

Fetal Peritonitis. By Alfred J. Scott, Jr., Los Angeles..... 410

BEDSIDE MEDICINE:

Acute Ear Disease in Childhood..... 412
Discussion by Wallace B. Smith, San Francisco; Simon Jesberg, Los Angeles; Howard W. Fleming, San Francisco.

EDITORIALS:

California Board of Medical Examiners and European Graduates..... 416

The San Fernando Plan—A Health Center Curative Clinic Experiment..... 417

Nobel Prize in Medicine Comes to California 418

Violation of State Narcotic Act Dangerous 418

EDITORIAL COMMENT:

The Rôle of Hydrogen Ion Concentration (pH) in Certain Ocular Symptoms. By George N. Hosford, San Francisco 419

Relapsing Fever in California. By George E. Coleman, San Francisco..... 420

Tularemia. By George R. Magee, Yerington, Nevada 421

Retinal Detachment—Diathermy Puncture and Coagulation. By Dohrmann K. Pischel, San Francisco..... 421

STATE MEDICAL ASSOCIATIONS:

CALIFORNIA MEDICAL ASSOCIATION..... 422
C. M. A. Department of Public Relations..... 426
Woman's Auxiliary to the C. M. A..... 427
NEVADA STATE MEDICAL ASSOCIATION 429

MISCELLANY:

News 430
Correspondence 431
Twenty-Five Years Ago 432
Board of Medical Examiners of the State of California 432
California Medical Association Directories..... Adv. pages 2, 4, 6
Book Reviews ..... Adv. page 11

ADVERTISEMENTS—INDEX:
..... Adv. page 8

"Entered as second-class matter at the post office at San Francisco, California, under the Act of March 3, 1879." Acceptance for mailing at special rate of postage provided for in Section 1103, Act of October 3, 1917, authorized August 10, 1918.

GREENS' EYE HOSPITAL

. . . for Consultation, Diagnosis, and Treatment of the Eye

BUSH AT OCTAVIA STREET

San Francisco

Telephone WEst 4300

THE HOSPITAL

As an aid in the study and diagnosis of eye conditions, Greens' Eye Hospital maintains a fully equipped

Ear, Nose, and Throat Department

This department is conducted on the same basis as the eye clinic and is open to all patients for the treatment of Ear, Nose, and Throat.

●

EMERGENCY EYE SERVICE

A twenty-four hour emergency eye service including Sundays and holidays is now available with an Ophthalmologist on duty.

Staff

OPHTHALMOLOGY

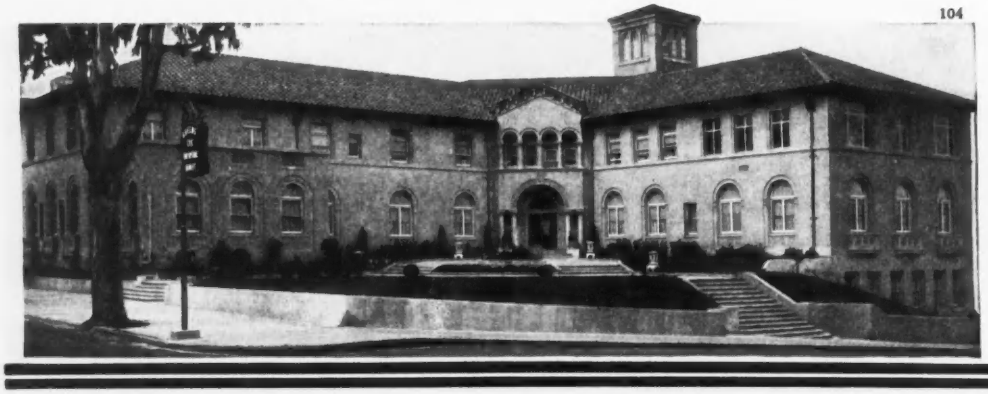
Aaron S. Green, M. D.
Louis D. Green, M. D.
Martin I. Green, M. D.
Einar V. Blak, M. D.
Vincent V. Suglian, M. D.

OTOLARYNGOLOGY

Lafayette P. Monson, M. D.

Address Communications to Superintendent

104



CALIFORNIA AND WESTERN MEDICINE

Owned and Published Monthly by the California Medical Association
FOUR FIFTY SUTTER, ROOM 2004, SAN FRANCISCO
ACCREDITED REPRESENTATIVE OF THE CALIFORNIA AND NEVADA MEDICAL ASSOCIATIONS

VOLUME XXXIX DECEMBER, 1933 No. 6

INSULIN-FREE PANCREATIC EXTRACT AND THE CIRCULATORY HORMONE (KALLIKREIN OF FREY AND KRAUT)*

A COMPARATIVE STUDY OF THEIR EFFECTS ON ANGINA PECTORIS

By FRANKLIN R. NUZUM, M. D.
AND
ALBERT H. ELLIOT, M. D.
Santa Barbara

DISCUSSION *by H. O. Koefod, M. D., Santa Barbara; Hans Lisser, M. D., San Francisco.*

IN 1920, Pribram and Herrnheiser,[1] studying the nondialysable fraction of human urine, found that it caused a fall in blood pressure on injection into the rabbit. Eight years later, Prof. E. K. Frey, chief of the Sub-surgical Clinic of the Medical Academy of Düsseldorf, and his coworkers described the properties of a vasodilator substance recovered from the urine, which he now regards as a hormone and which he has named Kallikrein. This principle exerts a regulatory function upon the distribution of the circulating blood, dilating the arterioles of the brain, lungs, skin and muscles[2] with resultant fall in blood pressure. Elaborated in the pancreas, it exists normally in the circulating blood in combination with an inactivator, a polypeptide probably produced in the lymph glands, and is released by change of p^H to the acid side.[3,4] It is secreted into the urine in an active form where it may be recognized by a typical reaction on intravenous injection into the experimental animal, namely, a fall in blood pressure and an increase in amplitude of cardiac contraction.[5] Frey states that, when calibrated in dog units by this latter effect, one unit is contained in 3 to 5 cubic centimeters of human urine and 2 to 20 cubic centimeters of blood.[2] Chemically and physiologically this substance is distinct from histamin, cholin, purine bodies and other hormones.[5]

This substance has received extensive clinical trial on the Continent in the treatment of angiospastic disease with, to date, rather conflicting results. The literature is too large to be reviewed in detail. Favorable results have been reported in the treatment of essential hypertension,[6,7,8] angiospastic gangrene and intermittent claudication.[9,10,11] In angina pectoris, the available studies are conflicting, but Frey[9] and Leschke,[7] who have had the most experience with this method of therapy, have secured a favorable response in some cases, which Singer[12] attributes to a foreign protein reaction.

In 1929, Vaquez, Giroux, and Kisthinios[13] reported remarkable results in a series of twenty patients having angina pectoris treated with an insulin-free extract of pancreas whose physiologic activity had been studied by Gley and Kisthinios. These workers[14] prepared an extract which contains a heat-stable depressor principle, an adrenalin antagonist, which was found, upon intramuscular injection, to so ameliorate the anginal syndrome that Vaquez considered this method of treatment superior to other measures. He attributed the results to a trophic action upon the blood vessels. Numerous confirmatory reports have since appeared in the foreign literature[7,15,16,17] and one in this country.[18]

We have been studying these substances since 1930. Pharmacologic investigations, published in detail elsewhere,[19] may be summarized here. The extract of pancreas dilates the coronary arteries of the perfused heart of a rabbit to a greater degree than that produced by the most active of the purine derivatives, theophyllin ethylenediamin. The circulatory hormone (Kallikrein) is likewise a coronary dilator, but is somewhat more feeble than the pancreatic extract as compared on the basis of hypotensive activity.

The pressor effect in the rabbit of intravenously injected adrenalin may be inhibited by both of these substances. This is a constant attribute of the circulatory hormone, Kallikrein, but the adrenalin antagonism exerted by different batches of pancreatic extract is extremely variable. While we have been unable to produce the typical increase in cardiac contraction with any lot of pancreatic extract yet tested, it seems likely that the adrenalin antagonism exerted by some of the samples may be due to an inconstant content of circulatory hormone. The latter also protects the rabbit from lethal doses of intravenous adrenalin, but this protection is not afforded the rat. It is an interesting observation that the effect of ad-

* Read before the General Medicine Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

renalin upon the carbohydrate metabolism, as measured by hyperglycemia, is not influenced by the hormone.

Our attempts to identify the active principles of these preparations have not met with success. It has been suggested [18] that the pancreatic extract contains adenylic acid or adenosin, derivatives of nucleic acid which are depressor substances and coronary dilators. We have been unable to demonstrate their presence in these preparations by either biologic or chemical methods (data to be published).

In summary, we feel that, while the extract of pancreas may contain circulatory hormone, there is present, in addition, another substance, or substances, upon which, in part at least, its therapeutic activity may depend.

CLINICAL

In 1931, we reported the results of treatment with pancreatic extract obtained in twenty patients with angina pectoris.[20] A control series of forty patients, treated by the usual medical measures, was also studied. The extract was given intramuscularly in a dosage of from 30 to 60 hypotensive units on alternate days, or twice weekly, for a total of from ten to twenty injections. The course of injections was repeated a second or even a third time, if results were not apparent after the first series. The average follow-up period was 6.7 months, varying from 1 to 13 months. Two, or 10 per cent, of these patients were refractory; 25 per cent were somewhat relieved; 55 per cent were greatly helped, and two, who had been benefited, died later while under observation. These results were noticeably better than those obtained in the control group. The anginal attacks frequently ceased during or after the injections in the patients responding. In some instances this improvement persisted as long as six months. The response to treatment was nearly as good in instances of long-standing severe angina as in those patients suffering less severe seizures, and appeared to be quite independent of the presence of myocardial damage as shown in the electrocardiogram. Incidentally, we could not demonstrate any change in the latter as the result of treatment, nor was the blood pressure noticeably altered in those patients with hypertension.

It has been possible to follow to the present time fifteen of these twenty patients treated with pancreatic extract. Three have died—one from cardiac decompensation, one from a ruptured appendix, and one as the result of a coronary occlusion. The anginal attacks returned in four of the remaining patients and were not influenced by further exhibition of the extract. Another patient, previously reported as refractory to the treatment, has remained so on further trial. In seven patients the original improvement has been maintained. Four of these had a severe type of angina initially, of whom three had electrocardiographic evidence of myocardial damage. Two had attacks of moderate frequency and severity; one suffered from mild seizures. This, together with further use of the extract, has strengthened us in our opinion that hypodermically given pancreatic extract offers an addition of value to the therapy of angina pectoris.

CIRCULATORY HORMONE

During the past year, Dr. Fritz Bischoff, working in the Cottage Hospital laboratory, has been able to supply us with a limited quantity of a concentrated preparation of this substance. The method of preparation will be published elsewhere. We have treated ten carefully studied patients having angina pectoris with this preparation, and in a number of them have been able to compare its effects with those resulting from an exhibition of the extract of pancreas. The substance has been given intramuscularly daily, or on alternate days, in a dosage varying from 50 to 250 units (a unit being the amount which, injected into the jugular vein of a grown rabbit, is just sufficient to cause a fall in blood pressure and an increase in pulse amplitude of from three to four minutes' duration). There are no toxic effects, but in several patients a nonspecific protein reaction resulted which was subsequently obviated by initially graded small doses.

The group consisted of five females with an average age of fifty-nine years, and five males with an average age of sixty-five years. Hypertension was present in three of the females. The blood Wassermann reaction was negative in every instance. There was electrocardiographic evidence of myocardial damage in five patients.

Five of the patients received the circulatory hormone alone in a total dosage of from 600 to 4,500 units. Two patients were apparently benefited, but in one, a woman, the psychic element may well have been responsible. The other patient, a man seventy-seven years of age, with an angina of sixteen years' duration, has returned to his business, and has decreased his nitroglycerin intake from that of two to three tablets a day to one or two a week. However, he has been followed for only several weeks. The remaining five patients received both preparations, the hormone Kallikrein and the pancreatic extract. One patient died without receiving benefit. Two patients, after receiving extract of pancreas, were free of attacks for periods of three and seven months, respectively. Upon return of symptoms, they were given the circulatory hormone with apparent relief, but the follow-up observation has been relatively short. The two remaining patients are of particular interest. They received, respectively, 1,540 to 2,500 units of the hormone Kallikrein over periods of two and four weeks without benefit. They were then given the extract of pancreas. One patient suffered no further seizures after the sixth injection and has remained symptom-free to the time of writing, a period of two months. The other patient, who had previously had a coronary occlusion with a resultant incapacitating angina pectoris, likewise experienced immediate relief, and is completing her course of injections at the present time.

COMMENT

The laboratory evidence which indicates that the extract of pancreas is not dependent upon a content of circulatory hormone to explain its activity has been reviewed. We believe that the foregoing clinical experiences strengthen this assumption, but by no means prove it. Our series of patients treated with the hormone is small. We do not wish to draw the definite conclusion that this substance will prove valueless in the treatment of angina pectoris, but we believe that its primary field of usefulness will lie elsewhere. The extract of pancreas is, in our opinion, of definite value, and we recommend its trial, particularly in those patients who are not relieved by other measures.

SUMMARY

1. The physiologic properties of an insulin-free extract of pancreas and of the circulatory hormone (Kallikrein) are briefly reviewed.

2. Evidence is adduced which indicates that the pancreatic extract is not dependent upon a content of the hormone to explain its entire activity.

3. Experiences with the use of pancreatic extract in the treatment of angina pectoris are described. Favorable follow-up observations on a previously reported series of cases are given.

4. The results obtained by the use of both preparations in a small series of cases indicate that the circulatory hormone will prove ineffective in many instances, whereas an exhibition of the pancreatic extract may give beneficial results.

Santa Barbara Cottage Hospital.

REFERENCES

1. Pribram, H., Herrnheiser, G.: The Nondialysable Constituents of Human Urine, Biochem. Z. 111:30-80, 1920.

2. Frey, E. K., Kraut, H.: Nachweis und Wirkung eines Kreislaufhormons, Münchener med. Wchnschr., 75:763-764 (May 4), 1928.

3. Frey, E. K., Kreislaufhormon und innere Sekretion, Münchener med. Wchnschr., 76:1951-1952 (Nov. 22), 1929.

4. Frey, E. K.: A New Internal Secretion of the Pancreas, Foreign Letter, J. A. M. A., 95:676 (Aug. 30), 1930.

5. Frey, E. K.: Eines neues Kreislaufhormon und seine Wirkung, Arch. f. Exper. Path., 133:1-56, 1928.

6. Scharpff, W.: Die Behandlung der Hypertonie mit dem Frey-Krautschen Kreislaufhormon Padutin (Kallikrein), Deutsche med. Wchnschr., 57:675-678 (April 17), 1931.

7. Leschke, E.: Erfahrungen mit dem Kreislaufhormon "Kallikrein," Münchener med. Wchnschr., 77: 1167-1175 (June 22), 1930.

8. Binswanger, H.: Einige Beobachtungen mit dem neuen Kreislaufmittel "Kallikrein," Deutsche med. Wchschr., 57:1057-1058 (June 19), 1931.

9. Frey, E. K.: The Circulatory Hormone of the Pancreas—Its Therapeutic Uses, Deutsche Zeit f. Chir., 233:481 (Oct.), 1931.

10. Schauder, H.: Zur Behandlung des intermittierenden Hinkens, Münchener med. Wchnschr., 77: 485-486 (March 21), 1930.

11. Muskat: Weitere Erfahrungen mit Padutin (Kallikrein) bei Gestörungen auf arterieller Basis, Med. Klin., 28:301-302 (Jan. 15), 1932.

12. Singer, R.: Die praktischen Ergebnisse der "Herz Hormon" Therapie, Wien klin. Wchnschr., 46:39-42 (Jan. 9), 1931.

13. Vaquez, H., Giroux, R., Kisthinios, N.: De l'Action de certains extraits pancréatique dans le traitment de l'angine de poitrine, Pressé Medicale (Paris), 37:1277-1279 (Oct. 2), 1929.

14. Gley, P., Kisthinios, N.: Recherches sur la substance hypotensive du pancréas, Presse Medicale, 37:1279-1282 (Oct. 2), 1929.

15. Dimitricoff, C.: Contribution au traitment de l'angine de poitrine par le nouvel extrait pancréatique désinsuline, Progrés Med., 1762-1766 (Oct. 25), 1930.

16. Giroux, R., Kisthinios, N.: Les extraits désinsulinés en thérapeutique, Monograph, Paris, 1931, Masson & Cie.

17. Kisthinios, N.: Die therapeutische Anwendung des insulinfreien Pankreas-extraktes, Wien klin. Wenschr., 1:610-615 (May), 1931.

18. Wolffe, J. B., Findlay, D., Dessen, E.: Treatment of Angina Pectoris with a Tissue Vasodilator Extract, Ann. Int. Med., 5:625 (Nov.), 1931.

19. Elliot, A. H., Nuzum, F. R.: The Pharmacologic Properties of an Insulin-Free Extract of Pancreas and the Circulatory Hormone of Frey, J. Pharmacol. and Exper. Therap., 43:463-475 (Nov.), 1931.

20. Nuzum, F. R., Elliot, A. H.: Pancreatic Extract in the Treatment of Angina Pectoris and Intermittent Claudication, Arch. Int. Med., 49:1007-1018 (June), 1932.

DISCUSSION

H. O. Koefod, M. D. (1421 State Street, Santa Barbara).—I believe it can be conservatively stated that insulin-free pancreatic extract, now on the market under various trade names, is a distinct addition to our treatment of angina pectoris. With kallikrein, the substance obtained from urine, I have had no experience.

In a comparatively small series, while the amount of benefit has varied greatly, it has been definite in over one-third of the cases. In some it has been striking. In the perfused animal, it apparently brings about an increased and prolonged output through the coronary arteries by vasodilatation. It seems difficult to see how this can be the explanation in cases with markedly sclerosed coronary vessels, unless there is an added vasoconstrictor factor. There is clinically no suggestion of increased pressure within the aorta to account for the increased flow. To the possibility that the viscosity of the blood might in some way be changed, I have been unable to find any reference.

There is some question, however, as to the specificity of this substance. An extract with apparently similar action, and comparative results in the treatment of angina, has been prepared from voluntary muscle and other tissues.

Two of my first sixteen cases developed a coronary thrombosis while under treatment with pancreatic extract. This in all likelihood was coincidental. Doctor Wolffe and co-workers reported, in a paper published three years ago, the development of a coronary T-wave in two of twenty cases while under treatment. An elderly patient of mine with hypertension who did not respond to the pancreatic extract did well on euphylljn.

While I feel that the pancreatic extract is of distinct value, I believe it will require several years of clinical trial to find its true worth in the therapy of vascular disease.

H. Lisser, M. D. (384 Post Street, San Francisco).—Doctors Nuzum and Elliot deserve great credit for their timely presentation of observations on these interesting extracts. Though condensed with commendable brevity, even a slight acquaintance with this sort of investigation reveals the considerable skill and labor involved, both in the preparation of these substances and in their careful clinical application.

The authors, when inviting the writer to participate in the discussion of their conservative paper, were aware of his very limited experience with these hormones, but no doubt included him because of his particular interest in clinical endocrinology. His com-

ments, therefore, cannot be directed to the immediate points they raised, but must be transposed into reflections on the wider implications of their thesis.

The astute observations initiated by Herrick many years ago have permitted an improved recognition of the significant distinctions differentiating angina pectoris and coronary occlusion. The latter condition, with its graver import, is based upon coronary vessel damage, whereas the former arises, presumably, from sympathetic spasm. This underlying pathologic difference demands a correspondingly different therapeutic approach.

It is altogether likely that a number of circulatory disorders, in addition to angina pectoris, have their origin in the common denominator of sympathetic sensitization or hypertonus. One need but mention intermittent claudication, Raynaud's disease, certain forms of gangrene, perhaps essential hypertension, and autonomic imbalance with vasomotor instability, as familiar varieties of angiospasm.

In the attempt to ameliorate or alleviate these vessel tightenings, resort has been had to a great number of drugs capable of producing some degree of vasodilatation. From most of these, merely transient pharmacodynamic effects have been obtained. The results achieved by Nuzum and Elliott and their predecessors, to whom they refer, seem, in some instances at least, to be of a more durable character; perhaps because body substances are utilized of which there may be a lack, with restoration of a more normal circulatory mechanism.

In recent years effort has been redirected, both medically and surgically, to a more specific and profound attack on the transmission lines of the sympathetic system itself, or at certain power houses, such as the adrenals, which store and release some of the stimulating energies of the network. Surgeons have performed such daring and novel maneuvers as ganglionectomies, nerve resections, adrenal denervations, and even adrenalectomy, followed at times by spectacular relief. One need but cite the prompt and complete cessation of violent attacks of paroxysmal hypertension by removal of an adrenal paraganglioma (cases of Mayo, Pincoffs and Shipley, Porter and Porter).

After all, it may turn out that angiospastic states occur because of an undue ascendency of the adrenal medullary stimulant adrenalin, due to a deficiency of its normal antagonists such as the circulatory hormone of Frey (kallikrein) or the insulin-free pancreatic extract. Now that two separate and differing extracts have been prepared from the posterior hypophysis, and two (with the probability of two or three more) from the anterior pituitary, it would not be surprising if a third extract, in addition to trypsin and insulin, were established for the pancreas. Also, since the anterior pituitary-like substance obtained from human pregnancy urine and human placenta may not be different and separate hormones from the sex hormones obtained directly from the prehypophysis itself, but merely altered in transit from gland to urine, so is it not likewise conceivable that the insulin-free pancreatic extract and the circulatory-urine extract kallikrein may be one and the same, but that the latter has slightly different chemical and physiologic properties because of modifications during transit? Many substances undergo chemical change from their site of origin to site of elimination.

It is to be hoped that greater quantities of these circulatory hormones will be available, and that their potency may be increased so that adequate clinical data may be accumulated. The duration of potency must be ascertained. To this end each batch must be retested periodically. No doubt some of the failures from the use of the commercial preparations can be ascribed to loss of potency. It would be unfortunate if this promising therapy were prematurely abandoned. Further reports from Doctors Nuzum and Elliot, and others, will be awaited with interest.

HYPERPYREXIA BATHS AND EPILEPSY*

THE CHEMICAL AND PHYSIOLOGIC RESPONSES OF THE BODY TO HYPERPYREXIA BATHS, AND THEIR SIGNIFICANCE IN THE EPILEPTIC SYNDROME

By HELEN HOPKINS, M. D.
Los Angeles

DISCUSSION *by Samuel D. Ingham, M. D., Los Angeles; H. Douglas Eaton, M.D., Los Angeles; Thomas G. Inman, M. D., San Francisco.*

THE therapeutic use of hyperpyrexia baths has received increasing attention during recent years. The present state of knowledge concerning the underlying mechanism by which disease processes are influenced has not advanced, however, much beyond that of the ancients, who empirically discovered the healing properties of hydrotherapeutic measures many centuries ago.

Modern clinicians have pointed out the specific value of this measure and have directed attention to the febrile response of the body to hot baths as having special therapeutic significance. Many facts of practical importance have been added to the subject by the observations of Mehrtens and Pouppirt.[1,2]

Investigation along chemical and physiologic lines has revealed that the protective adjustments set into motion within the body upon exposure to high environmental temperatures are of such a magnitude as to be detected without difficulty, and of a quality as to directly alter the state of functional activity of the nervous system. Objective evidence for the latter assumption is found in the frequently observed clinical signs of tetany and of major convulsive seizures in epileptics during the course of hyperpyrexia baths.

The present discussion will bring to mind briefly the more prominent disturbances in chemical and physiologic equilibrium instituted by hot baths, and will attempt to correlate these changes with their apparent effect upon the convulsive tendency in patients presenting the epileptic syndrome.

SYMPTOMATOLOGY OF HYPERPYREXIA BATHS

A definite train of subjective and objective symptoms develops upon exposure of the human body to high temperature environments. These have been studied and well described by a group of careful observers.[3 to 10] The appearance of frank tetany in a certain number of subjects, and of convulsive reactions in many cases of epilepsy and general paresis, has led to a search for a possible explanation of these phenomena. Other neurological findings have been elicited under the influence of hyperpyrexia baths, to the end that localization of central nervous system pathology has been accomplished in a few cases. Temporary psychic disturbances have also been observed. Currie[11] described the abnormal symptomatology developed in baths of 105 degrees Fahrenheit in 1797, and advised strongly against temperatures above 100 degrees Fahrenheit.

* Read before the Neuropsychiatry Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

With these preliminary observations in mind, thirty-six hyperpyrexia baths were investigated in a group of well-defined and pronounced cases of the epileptic syndrome. Fifteen per cent of the baths induced typical major seizures, all appearing between twenty and forty-five minutes after the beginning of the bath, during the period of maximum chemical and physiologic change.

The self-evident conclusion that patients presenting convulsive disorders are not at all times in a state of susceptibility to artificially induced seizures is of special scientific interest. Certain preparatory changes, usually expressed in terms of excitability, precede the sudden release of nervous energy in the seizure. It is important to understand the nature of these changes before the mechanism for convulsive reactions may be comprehended. There is some evidence to show that an inherited constitutional convulsive tendency forms the basis for the later development of convulsions, whether of endocrine, chemical or organic origin.[12]

The periodicity of epileptic seizures may be said to represent evidence of a changing or cyclic susceptibility of certain individuals to convulsions, developed upon the basis of metabolic, chemical, physiologic and other changes not thoroughly understood. Foerster [13] and Rosett [14] have shown that the induced alkalosis of pulmonary hyperventilation does not regularly elicit convulsions in well-known epileptic subjects. Along the same line, Brody and De Barenne [15] have demonstrated the inherent fluctuations in excitability of the cerebral cortex. It remained for Krasnogorski [16] to show the pronounced effect of chemical and metabolic factors upon cortical excitation and inhibition.

The close observation of a large number of patients presenting the epileptic syndrome furnishes one with convincing information regarding the wave-like fluctuations in the intensity of nervous excitability occurring in these patients. Clues of impending attacks are acquired at times from the prodromal aurae, but much more frequently, and at an earlier period, are furnished by abnormalities in vegetative function (autonomic nervous system) and augmented motor and psychic activity (cerebrospinal and cerebral systems).

PHYSIOLOGIC CHANGES

The physiologic responses to hyperpyrexia baths are chiefly of respiratory and cardiovascular nature. Under ordinary environmental conditions, the demands of the human organism for cooling are compensated for by pulmonary hyperventilation, augmented elimination of water from the skin (loss of heat by evaporation), and direct radiation and conduction of heat from the body surface.[17,18] Under the conditions of the bath, heat cannot be dissipated at the surface; and since the pulmonary avenue of escape of heat is inadequate, the body temperature rises in direct proportion to the temperature of the bath. The baths of the present series were conducted with uniform technique, and resulted in a mouth temperature of 105 to 106 degrees Fahrenheit in thirty to forty-five minutes.

During the pulmonary hyperventilation of the bath, excessive amounts of carbon dioxid are lost in the expired air, lowering the carbonic acid content of the blood and terminating in a pronounced disturbance in acid-base equilibrium. Alkalosis of severe grade is developed. As the bath is continued the level of carbon dioxid in the blood falls so low that the respiratory center is only periodically stimulated, and a Cheyne-Stokes type of breathing makes its appearance.[19,20]

With exposure of the body to external heat, extensive peripheral vasodilatation is reflexly developed.[21,9,22,23,7] The sudden widening of the vascular bed and the consequent fall in peripheral resistance, as observed in greatly lowered diastolic pressure values, calls for cardiac and blood volume adjustments to insure the continuance of adequate circulation of the blood. The rate and the force of the heart beat are greatly increased, as reflected in the rapidly rising pulse rate and systolic pressure level. Blood volume increases by hemodilution of 10 per cent for the dual purpose of filling the greatly dilated vascular bed, and of bringing a greater volume of blood to the surface of the body for dissipation of heat through the evaporation of the sweat, as well as for direct radiation and conduction of heat from the surface.[17,18]

In addition to these changes, Mehrtens and Allred [24] have studied the intracranial pressure changes during hyperpyrexia baths. With rising increments of body temperature, the intracranial pressure was found to increase steadily.

In summary, the physiologic adjustments to hot baths have a less apparent and less direct influence upon nervous excitability than those of a chemical nature; nevertheless, those changes which have an activating effect upon the convulsive tendency are, in the light of recent research, the water shifting and the altered intracranial pressure relationships.

CHEMICAL CHANGES

The acid base shift of hyperpyrexia baths may be universally demonstrated in rising p_H values.[25,26,27,10,28] The ultimate pronounced grade of alkalosis follows the loss of carbon dioxid or carbonic acid from the blood (acapnia) during attempted cooling of the body by pulmonary hyperventilation.[29,30,20,31,5,25,18,6,7,9,10] The uncompensated carbon dioxid deficit thus established, by influencing the dissociation of oxyhemoglobin, causes the development of a state of functional anoxemia within the body.[32] The coexistence of alkalosis and anoxemia has given rise to a controversy of many years standing: it is generally agreed that augmentation of nervous excitability develops during hyperpyrexia baths, but a difference of opinion exists in assigning the cause to the alkalosis *per se*[33,34,35,32,9,10] or to the functional anoxemia.[31,20,36,6,37,38,21,32,28,7]

With these changes in nervous function in mind, further chemical studies have been made (unpublished data). In correspondence with Barbour's observations,[17,18] blood dilution of 10 per cent was demonstrated at the peak of body temperature. Blood sugar values declined roughly 10 per cent.[4,6,10,18,26] Diffusible and total serum calcium

analyses revealed a steady downward trend which, although not great, was, nothwithstanding, significant. The reciprocal relationship between calcium and inorganic phosphorus was born out by the rising serum inorganic phosphorus values.

Despite the presence of blood dilution, the albumin and globulin serum protein fractions were found to increase, owing to the influx of tissue proteins into the blood during the water-shifting.[39, 40, 18, 41] The sodium chlorid content of the blood was not appreciably altered, indicating a balanced equilibrium between the tissue fluid and the blood.[42, 43, 44]

A review of the literature dealing with the influence of blood chemical conditions upon nervous excitability shows that states of alkalosis, anoxemia, hypoglycemia, low diffusible calcium and high inorganic phosphorus content of the blood, have a stimulating action upon nervous tissue. Furthermore, the recent work of Hodskins and his co-workers [45] has shown blood dilution to be associated with the active phases of the epileptic syndrome.

It could be said that the qualitative chemical changes established within the body under the influence of hyperpyrexia baths possess a uniformity of action upon nervous tissue, and in combination exert a pronounced augmenting effect upon nervous excitability.

SUMMARY

The effect of hyperpyrexia baths upon the human organism, then, is one of augmentation of cellular excitability developed upon the basis of alterations in chemical and physiologic equilibrium. The present discussion has been confined to these changes as they concern the functional activity of the nervous system. By the use of this measure, latent neurologic and psychic abnormalities have been made apparent.

The experimental use of hyperpyrexia baths in the study of convulsive disorders has been of practical value in the localization of the central pathology, and has shifted some of the clinically functional cases into the organic group. One outstanding example comes to mind of an adolescent girl who, after investigating the nature of her symptoms and in the absence of positive neurologic findings, was classified as a functional case. A major convulsive seizure was elicited by the bath and unquestionable unilateral localizing signs were brought out. Subsequent encephalographic study after lumbar air injection confirmed the localization and revealed an extensive unilateral atrophy of the cerebral cortex.

In view of the percentage (15 per cent) of hyperpyrexia baths resulting in convulsive reactions in well-known cases of the epileptic syndrome, it should be borne in mind that failure to induce a seizure does not rule out the possibility of epilepsy, while positive results are not only of diagnostic value, but frequently lead to the localization of the lesion.

Because of the property possessed by high temperature baths of augmenting nervous excitability, and of transposing latent into manifest neurologic signs, this experimental method can be offered for the study and diagnosis of a wide variety of disorders of the nervous system. The experimental investigation of the changes effected within the body by hyperpyrexia baths should lead to a better understanding of excitability, and to the discovery of the mechanism for the beneficial influence of fever therapy upon specific disease conditions.

925 Pacific Mutual Building.

REFERENCES

1. Mehrtens, H. G., and Pouppirt, P. S.: Arch. Neur. and Psychiat., 22:700, 1929.

2. Mehrtens, H. G., and Pouppirt, P. S.: J. A. M. A., 95:1910, 1930.

3. Haldane, J. B. S.: Jour. Hygiene, 5:494, 1905.

4. Sutton, H.: Jour. Path. and Bact., 13:62, 1908-1909.

5. Graham, G., and Poulton, E. P.: Quart. Jour. Med., 6:82, 1912-1913.

6. Bazett, H. C., and Haldane, J. B. S.: Jour. Physiol., 55:4, 1921.

7. Bazett, H. C.: Amer. Jour. Physiol., 70:412, 1924.

8. Bazett, H. C.: Jour. Amer. Med. Assoc., 97:1271, 1931.

9. Adolph, E. F., and Fulton, W. B.: Amer. Jour. Physiol., 67:573, 1924.

10. Landis, E. M., et al.: Amer. Jour. Physiol., 76:35, 1926.

11. Currie, J.: Medical Report on the Effects of Water, Cold and Warm, as a Remedy in Fever and Other Diseases. London. T. Cadell and W. Davies. 1797.

12. Cobb, S.: Arch. Neur. and Psychiat., 27:1245, 1932.

13. Foerster, O.: Zentralbl. f. d. ges. Neurol. u. Psychiat., 38:289, 1924.

14. Rosett, J.: Brain, 47:293, 1924.

15. Brody, B. S., and De Barenne, J. G. D.: Arch. Neur. and Psychiat., 28:571, 1932.

16. Krasnogorski, N. I.: Amer. Jour. Dis. Child., 45:355, 1933.

17. Barbour, H. G.: Proc. Soc. Exper. Biol. and Med., 18:186, 1920-1921.

18. Barbour, H. G.: Physiol. Rev., 1:295, 1921.

19. Douglas, C. G., and Haldane, J. B. S.: Jour. Physiol., 38:401, 1909.

20. Henderson, Y.: Amer. Jour. Physiol., 25:310, 1909-1910.

21. Uyeno, K.: Jour. Physiol., 57:203,1922-1923.

22. Goldschmidt, S., and Light, A. B.: Amer. Jour. Physiol., 73:146, 1925.

23. Grollman, A.: Amer. Jour. Physiol., 94:287, 1930; also ibid., 95:263, 1930.

24. Mehrtens, H. G., and Allred, W. L.: Proc. Soc. Exper. Biol. and Med., 28:604, 1931.

25. Haggard, H. W.: Jour. Biol. Chem., 44:131, 1920.

26. Flinn, F. B., and Scott, E. L.: Amer. Jour. Physiol., 66:191, 1923.

27. Cajori, F. A., Crouter, C. Y., and Pemberton, R.: Jour. Biol. Chem., 57:217, 1923.

28. Bischoff, F., Long, M. L., and Hill, E.: Jour. Biol. Chem., 90:321, 1931.

29. Mosso, A.: Archiv. ital. de biol., 42:192, 1904; also ibid, 43:216, 1905.

30. Haldane, J. B. S., and Priestley, J. G.: Jour. Physiol., 32:252, 1905.

31. Hill, L., and Flack, M.: Proc. Physiol. Soc., Jour. Physiol., 38:57, 1909.

32. Grant, S. B.: Amer. Jour. Physiol., 66:274, 1923.

33. Henderson, Y., and Haggard, H. W.: Jour. Biol. Chem., 33:333 and 355, 1918.

34. Collip, J. B., and Backus, P. L.: Amer. Jour. Physiol., 51:568, 1920.

35. Grant, S. B., and Goldman, A.: Amer. Jour. Physiol., 52:209, 1920.

36. Davies, H. W., Haldane, J. B. S., and Kennaway, E. L.: Jour. Physiol., 54:32, 1920.

37. Greenwald, I.: Jour. Biol. Chem., 54:285, 1922.

38. Morris, N.: Brit. Jour. Exper. Path., 3:101, 1922.

39. Kestner, O.: Ztschr. f. Biol., 70:95, 1919.

40. Barcroft, J., et al.: Phil. Trans. Roy. Soc., 211:352 and 455, 1922.

41. Hamilton, W. F., Barbour, H. C., and Loomis, N. M.: Jour. Physiol., 59:306, 1924-1925.

42. Erlanger, J.: Physiol. Rev., 1:177, 1921.

43. Barbour, H. G., et al.: Jour. Physiol., 59:300, 1924-1925.

44. Barbour, H. G., et al.: Amer. Jour. Physiol., 74:204, 1925.

45. Hodskins, N. B., Guthrie, R. H., and Maurison, J. Z., Amer. Jour. Psychiat., 11:623, 1932.

DISCUSSION

Samuel D. Ingham, M. D. (1253 Roosevelt Building, Los Angeles).—There is slow but definite progress in solving the problems of epilepsy, and what is more important, progress is being made in the obscure field of biochemistry. It has been fairly well established that varying concentrations of many different substances in the blood stream can be correlated with varying degrees of excitability in the central nervous system, and to a certain extent with the incidence of convulsions in those suffering from epilepsy. There is much evidence to indicate that the threshold for convulsions is lowered when the blood contains a low amount of diffusible calcium, sugar, and carbon dioxid. On the other hand, a high content of inorganic phosphorus and potassium likewise causes nervous irritability. A water balance in the tissues also appears to be a matter of importance. We have a rather vague conception of the existence of many other factors acting as so-called toxic agents, some of endogenous origin as indicated by the eclamptic and uremic states, and also exogenous substances of infinite variety. In general it may be stated that the whole problem resolves around the integrity and the functional activity of the nerve cells, singly or collectively, particularly as the cells are influenced each by its immediate environment, consisting of fluid derived from the blood containing varying amounts of many different chemical elements in varying combinations. The physical conditions influencing the functional activity of the cells include not only the chemical content of the fluid surrounding it, but the varying conditions of surface tension, electrolytic balance, colloid state, and other physical conditions. It will take a long time for science and research to correlate all of the facts that can now only be barely visualized. Doctor Hopkins' series of observations on epileptics who are given hyperpyrexia baths is another step in the direction of evaluating the changes induced by this procedure. No claim is made that it is a useful therapeutic measure, but valuable information may be obtained, especially in the way of diagnosis in cases of organic cerebral disease without manifest localizing symptoms. If by means of hyperpyrexia localizing symptoms of organic disease may be made manifest, the measure becomes an important diagnostic procedure in selected cases.

H. Douglas Eaton, M. D. (1136 West Sixth Street, Los Angeles).—Recent studies of epilepsy have not only added to our knowledge of the mechanism of convulsive seizures, but have provided us with practical aides in the treatment of this distressing disorder. Doctor Hopkins' excellent presentation of her painstaking observations on the physiological and chemical changes occurring in epileptics during hyperpyrexia baths is of definite value from the standpoint of etiology and diagnosis.

It is of interest to note that in spite of proved changes in water balance and in intracranial pressure, as well as the production of alkalosis and functional anoxemia, only 15 per cent of the baths produced seizures in a group described as showing well-defined and pronounced epileptic syndromes. These observations remind us again that we are still confronted with an unexplained and important factor in the genesis of convulsive seizures—the so-called convulsive tendency noted by Doctor Hopkins and other observers. The physiologic and chemical factors, such as alkalosis, anoxemia, and disturbances in water balance, act as excitants of this inherent latent hyperexcitability of the central nervous system. Further studies should yield us further practical help in the clinical handling of epileptics.

Thomas G. Inman, M. D. (2000 Van Ness Avenue, San Francisco).—In this paper the author presents the results of carefully conducted studies. The hyperpyrexia bath has enabled her to investigate the effects of temperature elevation in epileptics and to make such deductions from her findings as, in her experience, seemed warranted.

If the bath does nothing more in these cases than induce an attack in the presence of a trained observer, it would be a valuable aid to clinical investigation. Strange as it may seem, the physician seldom sees the convulsions he is called upon to treat; and since many convulsive attacks bear no relationship to epilepsy, the opportunity to observe a seizure may lead to a revision of opinion and point the way to curative therapy.

Epileptoid attacks can be induced in some individuals in a number of ways. It is a matter of clinical observation that certain individuals exhibit more or less mental disturbance, with increase in body temperature, and in children of the nervous type any febrile condition may be initiated by a convulsion. But this is not epilepsy.

In any consideration of the epilepsy problem it must be kept in mind that the generalized convulsion is but a motor cortex response to something which precedes it. Is it the unconsciousness, which seems to be an essential feature of the disease, or something initiated during that period that, acting through the circulation, sets the motor cells into action?

Or does the epileptic possess an easily excitable cerebral cortex, which occasionally reacts in this special manner to sudden variations, however induced, in circulatory balance? Epileptoid seizures can be brought about by inducing an arteriovenous capillary stasis, and it is not unlikely that this phenomenon is responsible for no small number of the secondary epilepsies. It is, however, not easy to explain the character of the epileptic and the numerous epileptic equivalents on these grounds.

Whatever the ultimate answer to the problem may be, Doctor Hopkins has added to the positive knowledge relating to the body chemistry of these unfortunates for which all interested are duly thankful.

Doctor Hopkins (Closing).—I am grateful for the comments made upon the subject material of the above paper. It becomes very evident that we are still dealing with surface phenomena, and have not penetrated far into the actual conditions developed within the central nervous system structures in preparation for convulsive reactions. The experimental and clinical methods in use today appear the more crude and ineffective when confronted with the necessity for understanding the mechanism of convulsions. We must ultimately know more about the individual cellular unit and the environmental conditions which influence its functional activity.

CARCINOMA OF THE COLON—FROM A ROENTGEN STANDPOINT*

By CARL B. BOWEN, M. D.
Oakland

DISCUSSION *by Kenneth S. Davis, Los Angeles; Robert R. Newell, M.D., San Francisco; Howard E. Ruggles, M. D., San Francisco.*

THE colon, including the rectum, is well known to be one of the commonest locations of malignancy. As the title states, we are only interested in the colon at this time. The comparative frequency of carcinoma in various segments of the colon is demonstrated by a small series of twenty-six pathologically proven cases collected over a period of five years at Highland Hospital in Oakland, California, in which there were three involving the cecum, two the ascending, four the transverse, four the descending, and thirteen the sigmoid. It is of interest that there have been seventy-four cases involving the rectum.

TECHNIQUE

In the consideration of carcinoma of the colon, the method of examination and technical procedures necessary are very important. They will only be briefly mentioned at this time.

The barium meal is of practically no value in the diagnosis of carcinoma of the colon, because of the irregular distribution of the meal throughout the lumen. The meal may be definitely contraindicated in that obstruction may be brought on by masses of barium becoming lodged at the level of a constricting lesion. Of course, in this instance, a barium meal, from the standpoint of diagnosis, would have definite value.

The barium enema is the most satisfactory of all examinations in the diagnosis of carcinoma of the colon, and the accuracy compares very favorably with the barium meal in the diagnosis of carcinoma of the stomach. Rankin, in his recent book on the colon and rectum, states:

> "Roentgenoscopic examination of the large bowel, whereby visualization is assisted by palpatory manipulation, now permits accurate localization and recognition of the pathologic type in more than 95 per cent of lesions of the large bowel. This advance has been largely due to the work of Dr. Harry M. Weber."

In reviewing the records of Highland Hospital, I find also a very high percentage of accuracy in the x-ray examination of proven cases of carcinoma of the colon, done by Dr. William Sargent.

As to the technical procedures involved, the preparation of the patient is most important. I am in the habit of advising an enema of warm water the night before the examination, and another, one and one-half to two hours before coming to the office in the morning. I stress the necessity of the enemata, how much water I wish them to take and how. Sometimes if enemata are inconvenient, I advise a cathartic the day before, with the patient limiting himself to a non-residue diet.

The barium enema should always be done under fluoroscopic control, with palpation of the abdomen while the fluid is going in. By this means a mass is sometimes felt at the site of some slight hesitation in the flow of the barium, which might otherwise be taken for transient spasm. Rotation of the patient, and placing the patient on the abdomen is in many cases necessary in order that overlapped loops of the colon may be separated, permitting visualization of all parts of the colon. This is particularly true in the recto-sigmoid region. At this point I would stress the importance of examination of the recto-sigmoid region with the sigmoidoscope, since probably more lesions are missed at this location than anywhere else in the colon, due to the overlapping of the coils of the colon at this level which cannot, in some cases, be satisfactorily separated by rotation of the patient.

Films, with the colon filled, are a necessity in that they verify fluoroscopic findings; or if not, they warn the roentgenologist that it might be well to look again. They occasionally also demonstrate questionable lesions, which were not noted in the fluoroscopic examination, and which should then be rechecked fluoroscopically.

Films following evacuation I find of great value, particularly in differentiating a questionable narrow annular carcinoma from spasm. If there is sufficient emptying in a case of spasm, the folds of mucous membrane will usually present a normal arrangement.

The air insufflation of the colon following evacuation of a barium enema, which has been prepared using considerable acacia in order that sufficient barium will adhere to the mucous membrane so that it can be readily visualized, has a very definite place in the examination of the colon, but probably not as a routine procedure. I believe that it has its greatest value in the visualization of pedunculated tumors, and in the case where there is overlapping of loops of the colon which cannot be separated by rotating the patient.

DIAGNOSIS

Diagnosis depends on the demonstration of a constant filling defect which, with suitable technique, should be demonstrable both in the fluoroscope and on the films. This may not be in evidence at all times during the examination due to overlapping of the coils of the intestine, or because of too great or too little filling.

The palpation of a mass in the region of the defect is corroborative evidence, and should be sought for. Occasionally the palpation of an unsuspected mass calls the attention to a small filling defect that might otherwise be taken for spasm or overlooked.

The disturbance in the regular arrangement of the mucosal folds in the partially emptied colon may point to an early carcinoma, or verify a suspected one.

The disturbance in peristalsis due to infiltration of the wall and the increase in the motility are findings which are suggestive of carcinoma particularly in the cecum and ascending colon; but they are by no means definitely diagnostic since tuberculosis can give a similar picture.

* Read before the joint meeting of Radiology and General Surgery Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

The insufflation of the colon following evacuation of a barium enema may be the means of demonstrating an early carcinoma, or of confirming a questionable one. However, except in polyposis, this examination usually only gives additional weight to evidence already brought out.

DIFFERENTIAL DIAGNOSIS

In the differential diagnosis, spasm must be considered in all parts of the colon. Occasionally there may be a localized area of contraction which could be due either to spasm or a narrow annular carcinoma. However, in spasm there is usually some change in the constricted area during the fluoroscopic examination, or in the various films made.

If the constriction is present during the entire examination without any palpable mass, reëxamination following sufficient belladonna to give a physiological effect should be done. At this time, if the constriction is due to spasm, it will in all probability have disappeared or changed its shape.

Benign tumors of the colon are usually smooth in outline, in contradistinction to the irregularity of malignant lesions, and do not infiltrate the wall.

In the cecum and ascending colon, in addition to the lesions which have already been mentioned, deformity due to encapsulated appendicial abscess, hyperplastic tuberculosis, lymphosarcoma and actinomycosis, have to be considered.

In encapsulated appendicial abscess, the deformity of the cecum is usually smooth, and there is a boggy rather than a hard mass, as is found in carcinoma. Occasionally the deforming is irregular and is undistinguishable from carcinoma, except for the doughiness of the mass.

Hyperplastic tuberculosis frequently presents a more extensive involvement than carcinoma; it is usually smoother in outline and the mass is slightly less resistant; it is more likely to produce obstruction; and the patients are usually somewhat younger.

Lymphosarcoma is extremely rare in the colon. Its commonest location is in the cecum. It grows rapidly, is not very tender, and is usually less hard than carcinoma on palpation. It is stated that there is a tendency for the cecum to dilate, probably due to disturbance of the local nerve supply. Due to the rarity of the condition in this region and the fact that the differential diagnosis is not entirely clear cut, a preoperative diagnosis is seldom made. One case came to operation at Highland Hospital in the last five years. No roentgen examination was made.

Actinomycosis is very uncommon and presents no characteristic roentgen picture. A finding in differentiation which is mentioned and might be of value is that actinomycosis usually infiltrates the anterior abdominal wall, while carcinoma is more likely to involve the posterior wall.

In the transverse colon spasm, which has already been mentioned, is the chief condition which must be differentiated.

In the descending colon and sigmoid, spasm and inflammatory conditions must be differentiated from carcinoma since it is in this part of the colon that the narrow annular carcinoma is most commonly found. The differential points between spasm and annular carcinoma have already been mentioned. In the differentiation of inflammatory lesions which are not uncommon in the sigmoid, particularly in women (since the sigmoid is closely related to the pelvic organs and as a result may be involved in pelvic inflammatory masses), the shape of the deformity is one of the most valuable differential points. The deformity in inflammatory lesions is usually longer, and the infiltration of the wall more uniform than in carcinoma. Also where the inflammatory lesion is secondary to diverticulitis there will be in all probability typical diverticula scattered along the colon in this region. The palpable mass in inflammatory lesions is usually definitely boggy rather than hard, as in carcinoma. In ulcerative colitis, where the process is localized to a few inches of the colon, carcinoma might have to be differentiated, however, as in other inflammatory processes involving the colon the extent of the involvement is usually greater and the thickening of the wall more uniform than in carcinoma.

CONCLUSION

I would like to stress the definite value of early roentgenologic examination of all patients with any questionable bowel disturbance, since records show that the average patient with carcinoma of the colon has had definite signs, symptoms, or both, many months before presenting himself for roentgen-ray examination. The records of Highland Hospital show an average of eight months between the beginning of symptoms and the diagnosis. This plea bears the weight of evidence mentioned before, that the accuracy of the diagnosis of carcinoma by x-ray is very high in competent hands.

1624 Franklin Street.

DISCUSSION

KENNETH S. DAVIS, M. D. (Saint Vincent's Hospital, Los Angeles.)—Doctor Bowen has given a very good presentation of what is known and practiced in the roentgenographic diagnosis of carcinoma of the colon.

As the author stated, one cannot lay too much stress on the advantages of the barium enema over the motor meal in ruling out organic lesions of the colon. The latter is only indicated in those cases where there is a complete obstruction to the barium enema, and one wishes to know the extent of the lesion. Only a moderate amount of the barium should be given by mouth where there is any indication of obstruction.

As to the preparation of the patient I find that cleansing enemas do not completely evacuate the cecal contents, and that catharsis is indicated in the majority of cases.

The author has stressed the value of roentgenograms immediately after evacuation of the barium enema. I have found it extremely valuable to take a film twenty-four hours after evacuation, particularly when I was suspicious of multiple diverticula, or an incomplete obstruction.

The diagnostic radiographic signs of cancer of the colon are: (1) the filling defect; (2) the palpable mass corresponding to the filling defect; and (3) the evidence of obstruction to the barium enema.

In the differential diagnosis between carcinoma and tuberculosis of the colon, the latter has such a predilection for the ileocecal region that a lesion in this

part, especially if associated with pulmonary tuberculosis, should make one suspicious of this disease. The chief roentgenographic characteristics of tuberculosis of the colon are (1) the marked spasm of the bowel and (2) the hypermotility of the barium through the area of involvement. The filling defect of a cancer is a constant one, whereas the filling defect of a tuberculosis is variable, depending on the degree of spasm at the time of the examination.

It is practically impossible to differentiate between a diverticulitis, with a large inflammatory mass, and a cancer, as the roentgenographic findings in the two conditions are almost identical. True, one may see diverticula present in other parts of the colon which should make one suspicious of an inflammatory rather than a malignant mass. We have had fourteen cases of this type at Saint Vincent's Hospital. Of this group, six had definite malignant changes and eight were purely inflammatory lesions. Whether the malignancy was a superimposed pathologic condition or was primary is a debatable question. However, from both the x-ray and surgical standpoint it should make no difference whether cancer is or is not present in the mass. The treatment is the same.

❋

Robert R. Newell, M.D. (Stanford University School of Medicine, San Francisco). — Doctor Bowen has brought out some very important points which need to be understood by all physicians, that they may make the best use of roentgen consultation. The possibility of overlooking a tumor in the rectum by barium enema, when it is easy to be diagnosed by digital or sigmoidoscopic examinations, will bear reiteration.

I disagree with Doctor Bowen in regard to preparation for barium enema. Inasmuch as the colon almost always retains a large amount of barium enema for some hours, I am skeptical of its ability to empty itself of a cleansing enema. I would rather have the colon quite empty instead of full of water which will dilute the diagnostic enema. My own preference is for castor oil, two ounces the afternoon before, and then nothing more to eat (or only orange juice). The advantage of castor oil over other cathartics is its quick and rather violent action, coupled with a prompt removal of the irritant. What portion of the oil is not evacuated is absorbed like any other fat and removed from the bowel (resynthesized in the lacteals to the bland neutral fat). There will be many cases, of course, that cannot be given a cathartic with safety. This is just one more reason why the radiologist should be given at least a telephonic consultation before going ahead with the examination.

The x-ray apparatus makers provide a metal enema tip which I consider cruel. A rectal catheter of soft rubber is much more comfortable and stays in ordinarily quite well. For those who cannot retain an enema it is possible to buy enema tips of soft rubber provided with an external rubber bag which can be inflated after insertion through the anus.

I wish to stress the fact that inflammatory lesions originating in the appendix, diverticulitis, and even the female pelvic organs, can imitate a neoplastic obstruction in the colon.

It is not infrequently impossible for the surgeon to tell whether he is dealing with an infectious or a neoplastic development, even after he has opened the abdomen.

Hyperplastic tuberculosis is also sometimes impossible to distinguish from carcinoma, though often the local hyperactivity of the bowel, associated with tuberculosis, may afford differentiation.

One intrinsic bowel obstruction not neoplastic must also be mentioned, namely, intussusception.

In conclusion, I would go even further than Doctor Bowen. I think we must hold ourselves ever ready to do painstaking examination of the colon on even slight symptoms, especially because of the good results of early removal of carcinoma of the colon.

❋

Howard E. Ruggles, M. D. (Fitzhugh Building, San Francisco).—Doctor Bowen has well emphasized the importance of a thorough, detailed examination in the diagnosis of carcinoma of the colon. Here, as elsewhere in the gastro-intestinal tract, early lesions are easily overlooked. Repeated examinations will not infrequently mean the saving of a patient's life as well as a professional reputation.

❋

Doctor Bowen (Closing).—Both Doctor Newell and Doctor Davis have spoken in favor of cathartics rather than enemata as preparation for a barium enema. There is no doubt that the method is very thorough; however, the results may be disastrous in a complete or nearly complete obstruction which has not been suspected by the roentgenologist. In doing a barium enema, following cleansing enemata, if there has not been a complete cleansing of the colon, it will be quite evident. At the same time any obstruction will present itself. If there is no evidence of obstruction, a cathartic can then be given safely and the barium enema repeated.

Doctor Davis has mentioned in the differential diagnosis of carcinoma and tuberculosis of the colon (1) the frequency of tuberculosis in the ileocecal region; (2) that tuberculosis in the colon is frequently associated with pulmonary tuberculosis; (3) that there is marked spasm of the bowel in the region of the lesion; (4) that there is marked hypermotility of the barium through the involved area; and (5) that the deformity of cancer is constant and that of tuberculosis is variable. It is true that the above five points apply to ulcerative tuberculosis of the colon; however, in hyperplastic tuberculosis, in my opinion, only number one applies. Hyperplastic tuberculosis of the cecum is very frequently present without evidence of pulmonary tuberculosis. Some authorities consider it a primary lesion. In the small number of cases of hyperplastic tuberculosis I have seen, the deformity has been constant; there has been no hypermotility and no pulmonary tuberculosis.

There is one point which I did not mention in the paper and that has not been discussed—the fact that in the large percentage of cases hyperplastic tuberculosis occurs before forty years of age, while carcinoma of the colon usually appears after forty.

ACTINOMYCOSIS OF THE KIDNEY*

By Theodore S. Kimball, M. D.

and

Robert B. Haining, M. D.

Los Angeles

Discussion *by Verne C. Hunt, M. D., Los Angeles; Howard A. Ball, M. D., San Diego; Charles Pierre Mathé, M. D., San Francisco.*

TEN THOUSAND autopsies have been performed during the last fifteen years (1918-1933) at the Los Angeles County General Hospital. Of this number, five were proved cases of actinomycosis; only one of the five showed actinomycotic involvement of the kidney. Recently Cummings and Nelson [1] collected thirty-seven reports of renal actinomycosis from the literature. They concluded that only eleven of these gave evidence of "primary" assault upon the kidney.

Those who have reported cases of renal actinomycosis have usually attempted to define whether the lesion was primary or secondary. Such a distinction is specious. According to our present knowledge, primary actinomycosis of the kidney is inconceivable, if we mean by "primary" that the lesion originated in the kidney. This use of

* From the Pathology Laboratory of the Los Angeles County General Hospital.

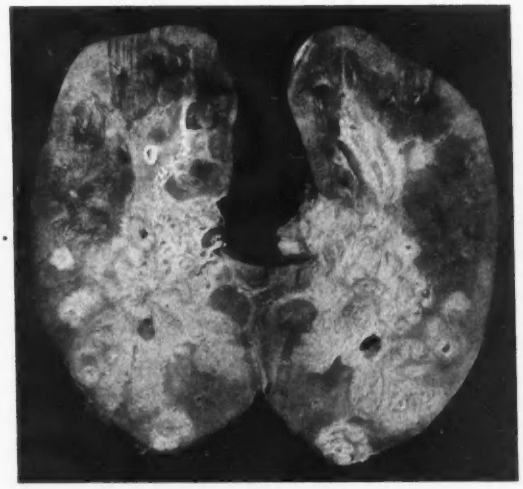


Fig. 1.—Actinomycosis of the kidney chiefly affecting lower pole.

the term is, therefore, unfortunate, and serves mainly to disguise our ignorance.

ACTINOMYCOSIS CONFINED TO THE KIDNEY

Recognizing the misnomer, Hunt and Mayo [2] suggest that the only justifiable way to retain the old terminology is arbitrarily to define primary renal actinomycosis to mean "actinomycosis confined to the kidney." This form of the disease, although rare, is definite enough to deserve special consideration. More commonly the kidney is involved secondarily by direct extension from the lung through the diaphragm, from the gastrointestinal tract, or by lymphatic or hematogenous metastasis from a demonstrable focus. At least eight cases are on record in which no primary site could be ascertained, and of these at least five showed a lesion which was so strictly "confined to the kidney" that complete recovery seemed to follow nephrectomy. In its susceptibility to surgical relief and in some other of its manifestations, this lesion is comparable with tuberculosis of the kidney.

In short, actinomycosis confined to the kidney has acquired importance, not by its frequency, but by its proved curability. It must be accorded respect as a clinical entity, and deserves an acceptable name. Israel was the first to report a case, and he described it as primary renal actinomycosis. In our opinion this is a misleading label, and it should be abandoned. "Actinomycosis confined to the kidney," while clumsier, is more explicit and more accurate.

METASTASIS OF RENAL ACTINOMYCOSIS

When actinomycosis "localizes" in the kidney, subsequent distant metastasis very rarely occurs. The percentage of successful nephrectomies (five out of seven, according to Hunt and Mayo [2]) testify eloquently to this observation. Indeed, we are unable to find in the literature a single report from which we can reasonably infer that metastases developed from a lesion which might previously have been described as "actinomycosis confined to the kidney." The present case seems to us to admit of no other interpretation than that it was at one time an example of actinomycosis confined to the kidney which went unsuspected for at least some months, and which later produced distant lesions by extension and hematogenous or lymphatic metastasis.

REPORT OF CASE

A white man, aged 38 years, in May, 1930, noticed severe pain in his right lower chest. The pain was made worse by deep inspiration. He was in bed three weeks with what his physician called influenzal pneumonia. Following this sickness, he gained weight slowly for three to four months.

In October he complained of a severe pain in the "upper left abdomen." This pain persisted for at least one month. About this time the patient began to lose weight and strength. He felt feverish at times, but there was no cough, no expectoration, no hemoptysis.

November 24.—He was awakened by a sense of suffocation. Next day he had a chill; his temperature was 102, and he was dyspneic. There was no cough nor expectoration. A pleuritic pain developed in the lower left chest.

November 30.—The patient was hospitalized, with a diagnosis of empyema. A rib resection was performed on the left side and a drainage tube inserted. Urinalysis at this time showed no albumin, no casts, no red blood cells; specific gravity 1025.

December 9.—The patient was admitted to the Los Angeles County General Hospital, complaining of chills, followed by profuse perspiration, extreme weakness, and shortness of breath. Physical examination revealed a temperature of 102, pulse 110, respiration 24, blood pressure 120/80. Both sides of the chest showed limited expansion. Foul purulent material was discharging from the thoracotomy wound on the left.

Laboratory report: Blood Wassermann, negative; blood culture, January 17, 1931, negative.

X-ray report of December 9, 1930: Chest—"Pleural sinus in the left lower thorax laterally, with markedly thickened parietal pleura, and with partial collapse of the lower lobe. Resection of the tenth rib posterolaterally, with drainage tube in this region. No free fluid shown. Pulmonary detail is rather hazy, but shows no definite parenchymatous infiltration except in the collapsed lower lobe."

December 3 to December 31.—The patient suffered frequent chills, followed by profuse perspiration. His afternoon temperature was 101 to 102.

December 31.—Another rib resection was performed in an attempt to secure more adequate drainage from the left pleural cavity. The attempt was successful, but the patient seemed to become steadily more septic.

January 16, 1931.—He developed an epididymitis on the left side, with induration of the cord as far as it could be palpated.

January 29.—He seemed to be losing ground rapidly, and was given a blood transfusion.

February 2, 1931.—The patient died.

Clinical Diagnosis.—The clinical diagnosis was bilateral empyema, cause undetermined, with contributory pyemia, hypostatic pneumonia, and septic epididymitis.

AUTOPSY

The only significant findings were in the thoracic cavity and the genito-urinary system.

Pleural Cavities.—On the left, at the level of the ninth and tenth ribs (both of which had been removed), was a walled-off cavity lined with fibrinous exudate, containing no free fluid. The left lung was markedly adherent to the upper surface of the diaphragm, but the diaphragm was not perforated.

Lungs.—The lung tissue subjacent to the abovementioned cavity showed marked infiltration to the extent of abscess formation for a depth of two to three centimeters. The remaining portion of lung tissue on the left side was free from gross evidence of pathology.

The right lung contained eight or ten discrete abscesses, the largest measuring two centimeters in diameter, each filled with green viscid purulent exudate. There was no other demonstrable lesion.

Kidneys.—The left kidney weighed 175 grams, and was practically surrounded by a pocket of greenish purulent material which was most profuse at the lower pole and around the pelvis. The outer surface of the kidney was greatly roughened. Section revealed a grossly mottled appearance not unlike that seen in pyelonephritis, except that around each of the abscess cavities there was what appeared to be a yellowish caseous membrane which gave to the entire process a semblance of chronicity. A large amount of greenish pus could be expressed from the substance of the kidney, indicating the presence of communicating abscess cavities.

The pus-filled space surrounding the left kidney was followed downward over the psoas muscle into the pelvis, and along the spermatic cord as far as the epididymis. The testicle had not been penetrated.

The right kidney was slightly enlarged, but showed no other pathologic change.

Postmortem Blood Culture.—From the heart, showed the presence of *Staphylococcus aureus.*

Smears.—From the left lung, showed Gram-positive cocci in small clumps resembling staphylococci. From the abscesses of the right lung, failed to reveal any organisms whatsoever.

Stained Smears.—From the left kidney, showed thread-like organisms with a distinctly granular appearance occurring in dense clumps suggestive of actinomycosis. A direct, unstained smear of the purulent material revealed the typical ray fungus.

MICROSCOPIC DIAGNOSIS

Left kidney: Multiple abscess formation, with nearly complete destruction of the renal parenchyma. In the center of each abscess is found a clump of organisms having the typical morphology and staining characteristics of actinomyces bovis. Some areas show the communication that exists between the various abscesses.

Right lung: Actinomycotic organisms found in all the abscess cavities.

Left lung: Several sections from the abscessed area show destruction of lung tissue having a totally different appearance from the abscesses of the right lung. No actinomyces are seen in any section.

Spermatic cord: These sections show a sinus tract in the connective tissue filled with purulent material containing an occasional clump of actinomyces. Routine sections of other organs reveal nothing of interest.

ANATOMICAL DIAGNOSIS

1. Actinomycosis of the left kidney with perinephric abscess extending down to the spermatic cord and along the cord as far as the epididymis.
2. Multiple actinomycotic abscesses of the right lung.
3. Old empyema of the left pleural cavity.
4. Staphylococcic abscess of the left lung.

COMMENT

Actinomycotic lesions were found in the left kidney and the right lung. Which took precedence?

The most convincing evidence is in the x-ray films made two months before death. If the multiple abscesses found at autopsy had been present at this time, suggestive shadows would surely have been noted in the films. No such shadows were found. It seems fair to conclude that the actinomycotic organisms reached the lung less than two months antemortem.

We have no exact method of measuring the duration of the kidney lesion, but such extensive involvement occurring within two months would contradict recorded experience with renal actinomycosis. In all probability the first attack upon the kidney took place several months, possibly a few years, before the victim died.

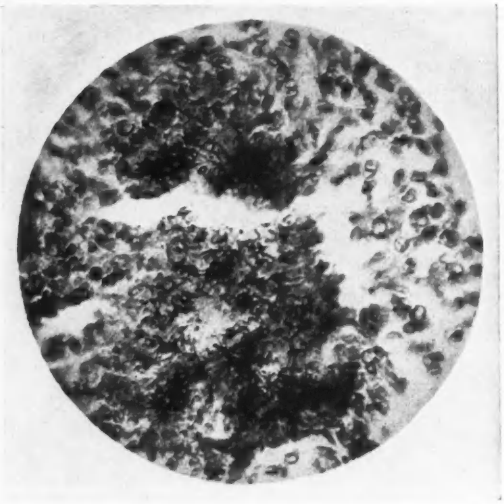


Fig. 2.—Photomicrograph, showing actinomycotic organisms. (Gram-Welgert stain.)

Moreover, actinomycosis, when it affects the lungs "primarily," tends to produce a large solitary abscess. The finding of eight or ten small discrete abscesses argues strongly for an actinomycotic pyemia, and in this case the source of the pyemia was probably the left kidney abscess or its extension along the spermatic cord.

Therefore, it seems reasonable to believe that until about one month before the man died (extension to the epididymis was noted in January, and the patient died in February), this was a case of actinomycosis confined to the kidney. It is idle to speculate whether there was a time when diagnosis and surgical interference might have saved the patient, but it is clear that, if unrecognized or recognized too late, actinomycosis confined to the kidney may break its confines by extension and distant metastasis.

In this instance the only recorded clinical evidence which might have led to a careful investigation of the left kidney was the left-sided, upper abdominal pain lasting over a month. However, the chest findings bulked so large that the kidneys were never brought under suspicion, adequate laboratory investigations were not made, and the autopsy revelations were a complete surprise. Probably other cases of actinomycosis confined to the kidney have been obscured by the presence of wholly unrelated conditions, and, failing autopsy, have escaped detection.

From a study of this case it appears that actinomycosis confined to the kidney may be a very modest intruder. It may remain practically symptomless even when a large portion of the kidney is involved. Of course, this patient's intrathoracic difficulties absorbed most of his attention, and unfortunately most of his attendants' attention also. Nevertheless, we must believe that symptoms referable to the kidney never bothered the man a great deal, in spite of the fact that his left

kidney was extensively invaded probably months before death.

We have reinvestigated the past history carefully by questioning members of the family. There is no evidence of preëxisting actinomycosis or of exceptional animal contacts.

In the absence of suggestive history, the diagnosis of renal actinomycosis has been made by pyelographic indications of renal tumor (three cases), by demonstration of actinomyces in urine (two cases), and by discovery of the fungus in postoperative sinuses.

When it can be shown that actinomycosis is confined to one kidney, the prognosis is quite hopeful if nephrectomy can be performed. Supplementary measures of attested value are chiefly the administration of iodides locally and systemically, the use of radium in the wound, and of roentgen rays over the wound area.

CONCLUSIONS

Actinomycosis confined to the kidney is a rare but definite clinical entity of proved surgical curability. Primary renal actinomycosis is a term with inaccurate connotations, and should be abandoned.

When actinomycosis localizes in a kidney, subsequent metastases are very rare. The present case demonstrates that, if unrecognized or recognized too late, actinomycosis may break its confines by extension and blood-stream metastasis.

Without significant history or recognizable primary lesions, the diagnosis of renal actinomycosis may be extremely difficult. Even when the parenchyma of one kidney is almost completely destroyed, the victim may have very few suggestive complaints.

1100 Mission Road.

REFERENCES

1. Cummings, R. E., and Nelson, R. T.: Actinomycosis of the Urinary Tract, Surg., Gynec., and Obst., 49:342-361 (Sept.), 1929.

2. Hunt, V. C., and Mayo, C., Jr.: Renal Actinomycosis, Annals of Surgery, 93:501-505 (Feb.), 1931.

3. Polayes, S. H., and Lederer, M.: Case of Actinomycosis of the Kidney, Jour. of Urol., 23:393-396 (March), 1930.

4. Recht, H.: Further Knowledge of Isolated Renal Actinomycosis, Deutsche Ztschr. f. Chir., 224:414-417, 1930.

5. Racic, T.: Isolated Actinomycosis of the Kidney, Beitr. z. path. Anat. u. z. allg. Path., 87:474-480 (June 27), 1931.

DISCUSSION

VERNE C. HUNT, M. D. (727 W. Seventh Street, Los Angeles).—The case herein reported is most worthy of recording in the literature. The authors have stated quite properly that renal actinomycosis must of necessity have its origin, or primary focus of infection, outside the kidney; that primary renal actinomycosis is entirely a misnomer unless the interpretation is made that, in speaking of primary renal actinomycosis, the kidney proves to be the only site in the body harboring an actinomycotic lesion. If such interpretation of the term is made in this particular case, it may hardly be considered one of true primary renal actinomycosis. The authors have raised the question as to whether the actinomycotic infection occurred first in the left kidney or right lung. The lungs provide the portal of entry for actinomycosis in a fair percentage of instances, and inasmuch as the pulmonary symptoms and findings in the case reported predominated from the onset of the illness to death, and that there were no urinary findings as late as five months following the onset of the illness, and that findings referrable to the left urinary tract did not occur until the last month before death, leads me to the opinion that the infection may have occurred first in the lung.

In 1929 I did a nephrectomy for renal actinomycosis, following which the patient made a complete recovery. The case was reported in 1930 as one of primary renal actinomycosis, inasmuch as there was no clinical evidence of actinomycosis elsewhere. At that time it was possible to find in the literature only eleven cases of renal actinomycosis which might be considered as primary in the kidney. However, after careful review of these cases, only five could be accepted as true primary renal actinomycosis in that actinomycosis did not exist elsewhere in the body. It is of interest that in only six of the eleven cases was nephrectomy done. Recovery occurred in only four of the eleven cases. The kidney becomes involved in only a small percentage of cases of actinomycosis of the thorax and abdomen. Pinner has stated that in 460 cases of actinomycosis of the thorax and abdomen there were sixteen in which the kidney was involved secondarily. Von Lichtenberg has stated that secondary actinomycosis of the kidney occurred in nine of the 128 fatal cases of actinomycosis in which necropsy had been done, an incidence of seven per cent.

❋

HOWARD A. BALL, M. D. (4643 El Cerrito Drive, San Diego).—Unique cases of this sort are valuable when recorded for study.

The authors make no comment on the rather prolonged disability resulting from the respiratory infection which antedated the abdominal trouble. From my knowledge of the chain of events in some other fungus diseases, I am inclined to feel that this history is significant. In coccidioidal granuloma, for instance, it is clear that most patients gain the infection through the respiratory system. The same was true in a personal case of generalized monilia infection. Involvement of the kidney with actinomycosis is almost certainly by hematogenous spread; and the most likely access to the blood stream is through the lungs. We know, however, that actinomycosis may involve the intestinal tract, and the natural assumption is that it follows ingestion of the organism. The lack of intestinal lesions in this case makes such an entrance unlikely. The failure to find pathology in the lungs on x-ray examination, however, does not preclude the entrance of the organism by this route. In cases of coccidioidal granuloma, at least, the primary assault on the lungs is healed as far as x-ray evidence goes, usually before the disease manifests itself systemically.

A practical point which this case exemplifies is the probable failure of anyone to carefully inspect the pus from the chest sinus. Granules typical of the disease are discharged from such sinuses constantly. The laboratory workers who handled the pus for other examinations are no more excusable for lack of careful inspection than the clinicians.

❋

CHARLES PIERRE MATHÉ, M. D. (450 Sutter Street, San Francisco).—It is well that, from time to time, rare pathological conditions of the kidney are called to our attention, otherwise their existence might be forgotten. Doctors Kimball and Haining, in reporting their case of actinomycosis of the kidney, have reminded us of a definite clinical entity actinomycosis confined to the kidney. This is a rare surgical disorder, often confined to one kidney, that can be relieved by early drainage or nephrectomy.

On account of the extreme rarity of this condition, it is highly probable that many of us, even those working in large urological services, will not encounter a case in a lifetime; however, the possibility of its occurrence should never be overlooked. In reviewing the literature on the subject, I was impressed by the fact that, in many cases suffering from suppuration of the kidney produced by actinomycosis, there was often an accompanying suppurative or nonsuppurative perinephritis. Most of the cases reported presented per-

sistent fever, leucocytosis, pain and tenderness in the lumbar region or upper abdominal quadrant, with a relative paucity of positive urine findings, etc.; signs and symptoms that, if carefully analyzed, should point the way to the diagnosis of suppuration confined to the cortex of the kidney or in the perirenal tissues. This accompanying perinephritis can be detected by a sign that I have described in a number of papers published by me on renal mobility, perinephritis, etc. This sign consists of lack of renal mobility, due to fixation of the kidney, which is easily ascertained by making an intravenous or retrograde pyelogram in the vertical posture, and which is of great importance in determining cortical abscess formation of the kidney as well as suppurative and nonsuppurative perinephritis.

In the essayists' case, the predominance of thoracic signs and symptoms overshadowed those produced by the actinomycotic renal and perirenal suppuration, and in that manner the attending physician's attention was detracted from the kidney region and abdomen. It is reasonable to assume that in their case the extensive suppurative perinephritis extending from the renal fossa down into the bony pelvis must have caused certain rather definite signs that usually accompany these lesions. I wish to emphasize the importance of making a complete urological investigation in cases in which the signs and symptoms lead one to suspect suppuration of the kidney, or of the perinephritic tissues. We are indeed grateful to Doctors Kimball and Haining who, in reporting their case of actinomycosis of the kidney, have called our attention to the fact that suppurative processes of the kidney might be caused by actinomycosis which, if detected early, can be relieved by surgical intervention.

CLINICAL TETANUS*

A STUDY OF ONE HUNDRED AND THIRTY-ONE CASES

By HYMAN I. VENER, M. D.
A. G. BOWER, M. D.
AND
J. E. MCKILLOP, M. D.†
Los Angeles

DISCUSSION *by Willard J. Stone, M. D., Pasadena; Louis H. Jackson, M. D., West Los Angeles; Burrell O. Raulston, M. D., Los Angeles.*

II‡

IT IS interesting to note that in the female group the mortality rate in cases with an incubation period of five days or less was extremely high, being 85.7 per cent. (See Tables 10 and 11.)

ETIOLOGIC FACTORS—SITES AND MORTALITY

Wishing to note the relationship of the various etiologic factors to the mortality rate, and whether any single injury received was more unfavorable than another, Table 12 is submitted.

From this table it may be noted that compound fractures with infection give the highest mortality rate, 100 per cent; automobile accidents, 75 per cent; postoperative, the third highest, with 71.4 per cent; while that of the three greatest causative factors, splinters, puncture wounds, abrasions, and lacerations, an approximate combined mortality of 58.5 per cent.

* From the contagious department of the Los Angeles County General Hospital, Unit No. 1. Service of Doctors McKillop and Bower.
† Dr. J. E. McKillop died on July 25, 1932.
‡ Part I of this paper was printed in November CALIFORNIA AND WESTERN MEDICINE, page 309.

TABLE 10.—*Incubation Period Among Males.*

Number Days Incubation	Number of Cases	Deaths	Recoveries	Per Cent Mortality
1- 5	10	5	5	50.
5-10	37	22	15	59.4
10-15	18	9	9	50
15-20	6	3	3	50
20-25	3	0	3	0
25-30	3	3	0	100
Unknown.	19	7	12	36.8

In Table 13 may be seen the relations between the mortality rate and the site of trauma.

In this table note the mortality rate of tetanus due to injury of the face, as contrasted with injury at other sites. Although only three such cases are included in this series, it would seem to disprove the old teaching that face injuries are uniformly fatal. Another fact obtained from this table is that tetanus originating from sites closest to the trunk in either arm or leg shows a higher rate; for example, leg injuries 72.7 per cent; foot 52.1 per cent. Clinical cases developing from trauma of the forearm have a mortality rate of 66.6 per cent, of the hand 57.5 per cent. Interesting to note is the postoperative mortality rate following surgery on the uterus, of 100 per cent—three cases and three deaths.

A very striking contrast is presented in Table 14 compiled on this relationship. Of those dying within three days after admission, 56.3 per cent died within the first twenty-four hours, and the other 43.7 per cent within the next forty-eight hours. Of these, four received no serum at all, dying before any help whatever could be administered. From the third to the sixth day the mortality rate was 85.7 per cent, and from the sixth to the ninth day, 71.4 per cent. Therefore, the average mortality rate of patients dying between the third and the ninth day period of hospitalization was 78.5 per cent.

Beginning with the ninth day of hospitalization, there was a sharp decline in death rate, it being only 10 per cent for all cases from the ninth to the eighteenth day; and only 5.8 per cent for all cases from the eighteenth to the twenty-seventh

TABLE 11.—*Incubation Period Among Females.*

Number Days Incubation	Number of Cases	Deaths	Recoveries	Per Cent Mortality
1- 5	7	6	1	85.7
5-10	10	6	4	60
10-15	1	0	1	0
15-20	2	1	1	50
20-25	1	0	1	0
25-30	1	1	0	100
Unknown.	13	8	5	61.5

TABLE 12.—*Relation to Special Injuries.*

Etiologic Factor	Number of Cases	Deaths	Recoveries	Per Cent Mortality
Puncture wound	46	27	19	58.7
Abrasions and lacerations	23	12	11	52.1
Splinters	17	11	6	64.6
Crushing injury	5	2	3	40
Postoperative	7	5	2	71.4
Compound fracture with infection	3	3	0	100
Gunshot wound	2	1	1	50
Auto accident	4	3	1	75
Stone	3	0	3	0
Glass	2	0	2	0
Harpoon	1	1	0	100
Fish hook	1	0	1	0
Unknown	17	9	8	52.9

day. *It becomes obvious that if patients can be kept alive for nine days, they have at least a 90 per cent chance of recovery.*

Comments on Patients Who Died.—An analysis of the four patients who died after a longer period than nine days of hospitalization follows:

CASE 1.—Surgical patient. Osteomyelitis of the hip. Operated on twentieth day after admission. Seventeen days later, or thirty-seven days after first admission, patient first developed tetanus, dying within twenty-four hours after onset of symptoms, despite 25,000 units of antitoxin.

* * *

CASE 2.—This patient received 125,000 units of antitoxin the first six days in the hospital. He died on the twenty-eighth day, and postmortem examination showed him to have died of tuberculosis of the lungs, prostate, and epididymis, having recovered from his tetanus.

* * *

CASE 3.—In the hospital twenty days. Was being treated for tetanus, following crushing injury of his fingers; and had had an amputation done by a private physician. While on our service he showed marked improvement after he had received 205,000 units of antitoxin, but died suddenly of anaphylactic shock while being given some antitoxin intravenously, after an elapsed period of six days during which interval he had received no serum.

* * *

CASE 4.—In the hospital ten days with a compound fracture of the forearm. Six days after admission he developed gangrene of the right forearm, which re-

TABLE 13.—*Sites in Relation to Mortality Rates.*

Site of Injury	Number of Cases	Deaths	Recoveries	Per Cent Mortality
Foot	69	36	33	52.1
Hand	17	10	7	57.5
Leg	11	8	3	72.7
Forearm	3	2	1	66.6
Face	3	1	2	33.3
Umbilicus	2	1	1	50
Back	2	2	0	100
Unknown	17	7	10	41.1
Postoperative: Uterus	3	3	0	100
Resection femur	1	1	0	100
Appendix	1	0	1	0
Hernia	1	0	1	0
Teeth	1	0	1	0

TABLE 14.—*Hospital Residence and Mortality Rates.*

Total Days in Hospital	Number of Cases	Deaths	Recoveries	Per Cent Mortality
Less than 24 hours	31	31	0	100
1- 3 days	24	24	0	100
3- 6 days	7	6	1	85.7
6- 9 days	7	5	2	71.4
9-12 days	10	1	9	10
12-15 days	9	0	9	0
15-18 days	3	0	3	0
18-21 days	17	1	16	5.8
21-24 days	5	0	5	0
24-27 days	2	0	2	0
27-30 days	8	1	7	12.5
30-34 days	3	1	2	33.3
60 days	3	0	3	0

TABLE 15.—*Antitoxin Dosage.*

Initial Dose Given Up to Units	Deaths	Recoveries	Per Cent Mortality
25,000 or less	16	19	45.7
25,000-50,000	25	17	59.5
50,000-75,000	20	19	51.2
75,000-100,000	5	6	45.4

TABLE 16.—*Antitoxin Therapy and End Results.*

Total Units Tetanus Antitoxin up to	Number of Cases	Deaths	Recoveries	Per Cent Mortality	Number Cases Receiving Only Initial Dose
25,000 or less	11	10	1	91.9	6
25,000-50,000	20	15	5	75	7
50,000-75,000	19	15	4	78	11
75,000-100,000	14	9	5	64.2	5
100,000-125,000	16	8	8	50	0
125,000-150,000	8	4	4	50	0
150,000-175,000	5	1	4	20	0
175,000-200,000	3	2	1	66.6	0
200,000-225,000	8	2	6	25	0
225,000-250,000	3	0	3	0	0
250,000-275,000	6	1	5	16	0
275,000-300,000	6	0	6	0	0
300,000-350,000	5	2	3	40	0
350,000-400,000	2	0	2	0	0
400,000-425,000	1	0	1	0	0
425,000-500,000	0	0	0	0	0
500,000-575,000	1	0	1	0	0

quired amputation. Following surgery he developed tetanus on the fourth postoperative day, and died quickly without receiving specific treatment.

Discounting these four cases, it may be stated that all uncomplicated tetanus patients who were in the hospital longer than nine days recovered. From this fact it should be the endeavor to keep patients alive for a period of at least nine days by all possible means, forcing the maximum dosage of serum in a minimum length of time.

RELATIONSHIP OF TETANUS ANTITOXIN TO MORTALITY

This analysis will not include the thirty-one patients who were moribund upon admittance.

Beginning in 1924, larger initial doses of antitoxin were administered by the various routes, averaging 60,472 units per case, whereas prior to this period the average was but 27,316 units.

Table 15 shows that, regardless of dosages up to 100,000 units as initial treatment, we are faced with a handicap of a mortality rate of approximately 50 per cent from the beginning.

Note the sharp decline in the death rate when a minimum amount of approximately 200,000 units of serum was used. (Table 16.)

In sixty-four cases receiving up to 100,000 units of antitoxin there were forty-nine deaths and fifteen recoveries, a mortality rate of 76.5 per cent.

TABLE 17.—*How Antitoxin Was Administered.*

Year	Number of Cases	Total Serum Intraspinally	Total Serum Intravenously	Total Serum Intramuscularly	Total Serum Intraperitoneally (p) or Cisternally (c)	Total Serum Used by All Routes
1916	1	26,000	22,000	3,000	.....	51,000
1917	2	3,000	55,000	2,500	.....	83,000
1918	1	6,000	66,000	1,500	.....	73,500
1919	13	143,500	158,000	224,300	.....	525,800
1920	8	251,500	454,000	405,500	.....	1,075,000
1921	9	27,000	613,000	121,000	.....	1,004,000
1922	8	245,000	409,500	189,000	.....	843,500
1923	13	457,000	999,500	343,000	.....	1,805,500
1924	9	465,000	825,000	241,000	(p) 403,000	1,531,000
1925	11	610,000	345,000	396,000	.....	1,754,000
1926	10	515,000	614,000	448,000	.....	1,577,000
1927	7	370,000	410,000	541,000	.....	1,321,000
1928	14	458,500	268,000	871,500	.....	1,598,000
1929	17	827,000	646,000	1,734,500	(c) 18,000	3,225,500
1930 (6 mo.)	3	60.000	175,000	125,000	(c) 105,000	465,000

TABLE 18.—*Comparisons of Results on the Two Services.*

Period	Number of Cases	Deaths	Recoveries	Died in 72 Hours	Died from Wounds or Conditions not Related to Tetanus	Died Later from Tetanus
8 years (general medical service) 1916 to 1924	56	32	24	22	0	10
6 years (special service) 1924 to 1930	75	38	37	33	4	1

Of these deaths twenty-seven received only one treatment and four received none, leaving thirty-three cases treated more than once. In the latter the mortality was eighteen deaths with fifteen recoveries, a death rate of 54.5 per cent in those treated more than once.

Of the thirty-two cases receiving between 100,000 and 200,000 units of antitoxin, all were treated more than once. There were fifteen deaths and seventeen recoveries, a mortality rate of 46.8 per cent.

Of the twenty-three cases that were treated with dosages between 200,000 and 300,000 units, there were three deaths and twenty-five recoveries, a mortality rate of 13 per cent. When 300,000 to 400,000 units were administered, there were seven cases with two deaths and five recoveries, or a mortality rate of 28.5 per cent.

In summing up the above findings we note that when over 200,000 units of antitoxin were administered, the mortality was only 15.6 per cent, or a decline of approximately 35 per cent in the death rate, as compared with smaller doses that were given.

In Table 17 an attempt has been made to determine the amount of serum given each year by the respective routes. All serum given into the tissues about the site of injury has been considered as intramuscular therapy.

In studying this series it was found that four patients had received the prophylactic dose of 1,500 units following injury, and later developed tetanus. Of this number there were three deaths and one recovery. Two of these patients received 1,500 units within twenty-four hours after injury, and the third within four days. The one patient who recovered received the antitoxin two days following injury.

COMPARISONS

An analysis of the eight years on the general medical wards as against those of six years in which all patients were cared for on one service follows. The general supportive treatment was much the same for both periods, as was the specific treatment, with the notable exception that during the past few years larger doses of antitoxin were given, and the initial dosage at present averages 90,000 units, given intrathecally, intravenously, and intramuscularly, 30,000 units each. We believe that further experience will probably cause us to increase the size of these doses.

All cases dying within seventy-two hours after admission to the hospital should not be listed with any analysis of treatment and, therefore, these cases will be deducted from both sets of figures because in every instance they were practically moribund and had no hope of recovery. They had either not been treated at all or else treatment was totally inadequate and they were dying on admission.

Therefore, in the period 1916 to 1924 there were thirty-four cases actually treated and ten deaths, or a mortality rate of 29.4 per cent, which when considered with the general rates of treated tetanus, is an excellent record. These cases averaged about 81,000 units.

In the period 1924 to 1930 cases averaged about twice the above dosage, and *there were thirty-eight treated cases with one death, or a mortality rate of 2.6 per cent.* Compare this with 86.8 to 95.2 per cent, the mortality figures existing during the Civil War period. As late as 1906 the average death rate was 83.1 per cent.

This death rate of less than 3 per cent, when large doses of antitetanic serum were used, when compared to cases treated with only a moderate amount of serum in which ten times the death rate was observed (or about 30 per cent), is such a marked difference that the employment of much larger doses of serum dare not be ruled out without further careful study.

SUMMARY AND CONCLUSIONS

1. If every case of tetanus admitted to the hospital be considered, only a diminution of 5.1 per cent in the death rate was noted when all patients were required to be segregated for treatment on one service, as contrasted with the figures obtained during the former practice of sending them to any of the various medical wards. However, if all patients dying within seventy-two hours after en-

TABLE 19.—*Antitoxin Dosage and Mortality.*

Period	Approximate Dosage	Cases Treated	Recoveries	Died	Mortality Rate
Years 1916 to 1924	81,000	34	24	10	29.4%
1924 to 1930	161,000	38	37	1	2.6%

trance into the hospital be deducted, we note a pronounced factor in favor of having all patients treated on one service, for this method gave only one-tenth the death rate observed under the former plan.

2. Incidence is three times as great in the male sex as in the females, but the mortality rate is approximately 13 per cent lower.

3. Puncture wounds were the greatest contributing factor, followed by abrasions and lacerations. The high incidence due to splinters is noteworthy. The foot was the commonest site of injury, and then the hand.

4. Postoperative tetanus following procedures on the uterus, and compound fractures with infection have the highest mortality rate. Splinters, puncture wounds, and lacerations follow in the order named. Tetanus about the face had a lower death rate than of the extremities. Tetanus originating in the proximal parts of an extremity was more fatal than that in the distal portions.

5. The greatest number of cases occur in the first fifteen years of life, and most of these between the ages of five to ten years.

6. Tetanus has increased approximately 42 per cent in the past five years, and the growth in population explains this only to a slight degree.

7. The mortality rate averaged about 50 per cent for the first twenty years of age, and 100 per cent for patients above the age of sixty.

8. The greatest number of patients had an incubation period of five to ten days, then ten to fifteen, with no definite relationship between the mortality rate and the incubation period; the mortality rate being approximately 58 per cent for the first twenty days.

9. Fifty-five patients dying in the first three days were not affected by the amount of serum given, and fifty-six per cent of these died within twenty-four hours after admittance.

10. After three days in the hospital there was a gradual decline in the mortality rate up to the ninth day. After the ninth day the mortality rate was reduced 68.5 per cent. The mortality rate was only 10 per cent for cases in the hospital from the ninth to the eighteenth day for all cases.

11. After the contagious unit started using twice as much antitoxin as an initial dose, the mortality rate of 29.4 per cent was altered to only 2.6 per cent.

12. The mortality rate was 54.5 per cent for all patients treated more than once, up to 100,000 units of serum being used; 46.8 per cent up to 200,000 units of serum; 13 per cent up to 300,000 units; and 28.5 per cent up to 400,000.

13. Of sixty-five patients treated more than once, with dosages as high as 200,000 units of antitoxin, the mortality rate was 50.7 per cent; while in thirty-two patients who received more than 200,000 units the mortality rate was 15.6 per cent, or a decrease of approximately 35 per cent.

14. The contagious unit used an approximate average of 161,000 units of antitoxin per case, as compared with approximately 81,000 units formerly used by the several general medical wards, with only a decrease in the mortality rate of about 5.1 per cent when all cases admitted, including those semimoribund, were counted. However, if cases dying in the first seventy-two hours be not included, then the contrast in the mortality rate is striking indeed.

COMMENT

1. Keep all cases of tetanus alive by all means at our command for at least three days, and if possible for nine days, after which time the mortality rate is minimum.

2. Statistics compiled from this paper tend to prove that if antitoxin is to be of any value it must be given early and in massive doses of not less than 90,000 units within the first twelve hours, and a variable dosage repeated again within the following twenty-four hours.

3. Doses up to 100,000 units as an initial treatment do not materially affect the mortality rate within the first seventy-two hours, and probably further experience will cause us to give much larger doses during this period.

4. At the present time practitioners of medicine face a 50 per cent mortality when initiating the treatment of a tetanus case, because no standards have been established concerning the amount of antitoxin to be given in order to effect a cure and lower the mortality rate.

5. Due to lack of prophylaxis, tetanus is more prevalent than thought to be by the individual practitioner, probably due to misjudging the serious consequences of neglecting a rather trifling injury.

6. The usual prophylactic dose of 1,500 units does not always protect, and judgment should be exercised in repeating or increasing the dose if the injury warrants.

7. The future mortality rate of tetanus will depend largely upon accurate and adequate statistics compiled by various institutions where such cases are treated by the administration of maximum amounts of antitoxin in the shortest possible period of time.

1531 Purdue Avenue, West Los Angeles.

DISCUSSION

WILLARD J. STONE, M. D. (65 North Madison Avenue, Pasadena).—Doctor Vener has added to our knowledge by his careful survey of conditions which may lead to infection with the tetanus bacillus and the treatment with large doses of antitoxin in the Los Angeles General Hospital. My interest in the subject has not lessened since a corresponding survey was made of forty-nine cases of tetanus treated in the Los Angeles General Hospital and reported in the *Journal of the American Medical Association* June 24, 1922. At that time it was advocated that larger doses of antitoxin should be used than had formerly been considered necessary in the treatment of this infection. We had apparently been able to reduce the mortality through the use of doses of antitoxin approximating 125,000 to 150,000 units. Doctor Vener has gone further and has advocated doses which may total 250,000 or 300,000 units. There is every reason to believe, in many cases of tetanus, that successful treatment depends upon the larger doses of antitoxin used, since the outcome depends upon the neutralization of toxin present in the body. Since we have no way of knowing the amount of toxin already formed, or being

elaborated in the infected patient, it appears logical, if any mistake of judgment is to be made, to err on the side of safety and use larger doses of antitoxin than have heretofore been considered necessary. This is especially true in the first twelve hours of treatment, when doses to be efficient should approximate 100,000 units or more. As emphasized by Doctor Vener, the patient faces a mortality possibility of 50 per cent upon the earliest clinical evidences of the disease. Such a handicap should impress physicians that in the treatment of tetanus halfway measures do not suffice. The expense of antitoxin may be a large factor for some patients. Three hundred thousand units of antitoxin, with a 10 per cent reduction given by the pharmacist for the large quantities used, will cost the patient approximately $300. The cost for 300,000 units with the 40 per cent discount to hospitals will be about $200. The increase in the incidence of the disease as seen in a large general hospital has been emphasized by Doctor Vener. This is undoubtedly due to the increasing number of automobile accidents. It is fortunate, since tetanus spores are not infrequently present in the intestines, that tetanus does not occur as a postoperative complication more frequently. One patient in my experience died of tetanus following a simple hemorrhoidectomy. Doctor Vener's series showed seven postoperative cases. Compound fractures with infection apparently give the highest mortality rate. In Doctor Vener's series of 131 tetanus cases only four patients had received prophylactic doses of 1,500 units of antitoxin. Three of these four patients died of tetanus. I have long believed that it would be better to give 2,000 units for prophylaxis and have urged manufacturers to increase the size of the prophylactic package to 2,000 units. *It should be emphasized that in any persistent infection, even though the patient has had a prophylactic dose of antitoxin, should a secondary operation be necessary, such as the amputation later of a leg, hand or finger, the prophylactic dose of antitoxin should be repeated prior to the contemplated operation. This is especially true if a period of two or three weeks has elapsed.*

✻

Louis H. Jackson, M. D. (1531 Purdue Avenue, West Los Angeles).—The thorough and painstaking analysis by Doctor Vener of a series of tetanus cases interests me very much. It opens new vistas of thought and adds considerable factual knowledge to a disease which, from its very inception, exacts a toll of 50 per cent. Therefore, any study that will tend to lower this frightful mortality deserves our utmost attention.

A survey of the literature on the subject of tetanus reveals that many therapeutic agents, in addition to antitoxin, have been advanced in the management of this disease. The German writers stress the importance of controlling convulsions by the aid of novocain locally and intrathecally. I can see some advantage of the local treatment, particularly with relation to the muscle spasm of the masseter muscles where interference with nutrition becomes a serious problem. The phenol and magnesium sulphate methods of treatment are quite prevalent on the Continent. The French theory of phylaxis or cell fixation relates to drugs, which have a greater affinity for nerve cell tissue by displacing the tetanus toxin, thereby impeding the absorption of the latter along the nerve sheaths. The various experiments that have been carried on with the above mentioned methods are confined mostly to a limited number of patients and do not give an adequate appraisal of their value in the successful treatment of the disease. It seems that they are all neglecting the fact that the tetanus bacillus develops a severe toxin whose most remedial therapeutic agent is an antitoxin available for instant use. The prime difficulty has apparently been in not properly evaluating the advantage of administration of massive doses of antitoxin as soon as the disease is clinically recognized. This particular phase of the treatment in Doctor Vener's paper stands out in relief. He shows very conclusively that, for antitoxin to have curative value and control of mortality, it must be given in doses of not less than 250,000 units.

Now the question that arises is whether the administration of antitoxin should be spread over a period of days or given within a limited time, say the first twelve hours. Here, I believe, lies the crux of the whole question. It is my conviction that it would serve the best interests of the patient to give an optimum dose as soon as the diagnosis has been made. What that optimum initial dose should be will, no doubt, depend on the age of the patient, the severity of the disease, and the incubation period. All are factors to be considered.

Another striking feature of the paper, and one from which a valuable lesson can be learned, is the apparent indifferent attitude of the profession as a whole to the seriousness of the disease. Out of 131 patients only four received a prophylactic dose of 1,500 units, though in defense of the profession it may be said that possibly not many applied for first treatment. It is quite obvious that the ordinary 1,500 units, as customarily used for prophylaxis, does not offer full protection. According to Doctor Vener's paper, it is the trifling injuries that lead and furnish most of the exciting factors in the incidence of the disease. The gravity of the disease, with its tendency to increased incidence, imperatively demands the intelligent coöperation of the whole profession that better prophylactic measures should be instituted and the more standardized method of procedure be adopted.

Regarding prophylaxis, I rather believe that more radical measures should be taken and at least 5,000 units as an initial dose should be given to any potential case and, as Doctor Stone states, under certain given conditions, it should be repeated as each individual case warrants.

✻

Burrell O. Raulston, M. D. (University of Southern California, Los Angeles).—It is indeed encouraging to find a record of progress concerning any disease and especially with such a serious condition as tetanus. Since the causative agent in this disease is so widespread, and injuries from accidents are increasing, prevention of infection cannot well be accomplished. It is therefore especially gratifying to find such progress in treatment of the disease, as is indicated in the statistics presented in this study. Modern texts of medicine give directions for the use of antitoxin and the various drugs to be used in conjunction with it, but so far as I know, the use of such amounts of antitoxin, as recommended by Doctor Vener, is not common.

The cost of treatment, as pointed out by Doctor Stone, is an important factor and a strong argument for the maintenance of institutions for the proper treatment of this condition at a minimal price. It is easy to understand that a lack of funds as a part of the problem of treating tetanus might mean the difference between success and failure.

✻

Doctor Vener (Closing).—We certainly agree with Doctor Stone that halfway measures do not suffice in the treatment of this particular disease. We further realize the enormous cost of the dosage of antitoxin advocated and wonder if this does not prevent using the more massive doses, placing reliance more on the adjuvant symptomatic treatment with smaller amounts.

We can only partially share the view expressed about increasing the prophylactic package dosage to 2,000 units. For ordinary purposes, we feel that the present size syringe is sufficient and can be repeated within two to three days if indicated in the judgment of the physician. If, however, there is a large, dirty, macerated wound, then the minimum initial dose should be 5,000 units as a prophylactic measure.

We heartily concur with the opinion of Doctor Stone that, should a secondary operation become necessary, the prophylactic dose should be repeated, but care should be taken to first desensitize the patient to the horse serum.

We have had no experience in the use of the various methods of treatment described by Doctor Jack-

son as practiced on the Continent. We feel that our end-results justify a continuance of our program of therapy, its concomitant symptomatic treatment, and the particular nursing of cases as practiced in our hospital.

The French theory of phylaxis is being supplemented with our active serum therapy in a second series of cases now in the course of preparation since completion of this paper, and we feel that it may have some merits.

We believe that any case suggestive of tetanus should have special consideration by the attending physician; also hospitalization and consultation, regarding massive dosage, with some one particularly experienced in this special phase of medicine.

In the near future we hope to present a supplementary study of about thirty-five additional cases, compiled since July 1, 1930, and covering a period of about two and one-half years, with special reference to active therapy and incorporating the principles outlined in this paper; stressing the necessity of securing relaxation of the patient before medication.

THE PROBLEM OF DYSMENORRHEA*

By LUDWIG A. EMGE, M. D.
San Francisco

DISCUSSION *by Clifford A. Wright, M. D., Los Angeles; John W. Sherrick, M. D., Oakland; Ruby L. Cunningham, M. D., Berkeley.*

DYSMENORRHEA, like headache, is an expression of discomfort, not a disease nor a pathologic entity. Experience with surgical section of the superior hypogastric or presacral nerve, or blocking of the uterocervical ganglia of Frankenhäuser by alcohol injection, leaves little doubt that pelvic discomfort is transmitted or localized by the pelvic division of the sympathetic nervous system. As far as is known, there are no motor fibers to the uterus contained in the nerve trunks, because sympathectomy is not followed by any disturbances in menstrual flow, parturition, bladder or anal control (Cotte,[1] Kennedy,[2] Fontaine and Herrmann [3]).

The ovaries and tubes receive their nerve supply from the ovarian plexus, which is formed by fibers from the middle mesenteric and the renal plexuses. Fibers from the ovarian plexus anastomose with the inferior as well as the superior hypogastric plexus. Afferent impulses arising in the ovaries and tubes may, therefore, be transmitted in two directions, while afferent impulses arising in or near the uterus ordinarily travel only by way of the superior hypogastric plexus. Both systems are linked to the mesenteric celiac and renal plexus. It is most likely that this intricate connection furnishes the explanation for nausea and vomiting incidental to severe dysmenorrhea, transmitting impulses which result in the reversal of the gradient of peristalsis.

EXPLANATION OF PELVIC PAIN

The basic explanation for any pain production in the pelvis rests, therefore, on any irritation or pressure affecting the pelvic sympathetic system. That the causes are many is evident. If such pain occurs in connection with menstruation, we call it dysmenorrhea. The physical expression of this pain varies in degree according to the constitutional and psychologic endurance of a given individual. The evaluation of such an expression by a second or third person is an extremely difficult matter, and statistics based on such evaluations are simply personal impressions and not facts founded on an accepted standard. It is, therefore, not surprising that figures on dysmenorrhea are at such great variance. In Schröder's [10] review in "Veit-Stoeckel's System of Gynecology," the frequency of dysmenorrhea ranges from 2 to 80 per cent. More recent observers have attempted to eliminate the personal factor, but figures are still considerably at variance.

REVIEW OF HISTORIES

Desiring to know how many of my own patients complained of dysmenorrhea, and with what success I had treated them, prompted me to review the menstrual histories of 4,500 consecutive patients. I recorded pain at menstruation roughly five hundred times, or 11 per cent, taking as my standard all expressions of pain more severe than a passing discomfort. I felt this to be a very liberal interpretation and fairly reliable, since I was dealing with an intelligent group of women, and since all recordings and interpretations were my own. In studying the literature, I have been impressed with the fact that observations made under similar conditions usually yield low figures, while composite observations made by a correlator from the records of others frequently yield high figures. This is particularly true of reports of large industrial and insurance concerns. Any figure reported is, therefore, only an expression of individual interpretation, and the further the interpreter or correlator is removed from the individual contact with the patient, the greater the possibility for error.

In 370, or 8.2 per cent, of the patients studied, the cause for the menstrual pain could be laid to a readily recognizable lesion. They were, therefore, classed as suffering from extrinsic or acquired dysmenorrhea. The remaining 130, or 2.8 per cent, patients did not present a readily demonstrable cause, and since their disturbance dated, in most instances, from the onset of menstruation they were classed as suffering from primary or intrinsic dysmenorrhea. Treatment in the former group was evident, and will not be discussed here.

ANALYSIS OF PATIENTS WITH INTRINSIC DYSMENORRHEA

An analysis of the 130 patients suffering from intrinsic dysmenorrhea brought out some very interesting facts. In the first place, most of these patients had received previous treatment without any relief, and forty-five of them had been operated because of dysmenorrhea. The variety of operative procedures is illuminating: appendectomy, 18; suspension with or without appendectomy and dilation of cervix, 6; resection of ovaries, 5; bilateral salpingectomy, 1; unilateral salpingectomy, 3; dilation of cervix and curettage, 8; radical cauterization of cervix, 2; and stem pessary, 2.

---

* Read before the Obstetrics and Gynecology Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

TABLE 1.—*Showing Relative Frequency of Dysmenorrhea*

Correlator	University	Number Patients	Percentage of Dysmenorrhea	
Boynton	Michigan	2,282	.....	20.38
Cunningham	California	14,268	First 5 years Second 5 years	17.30 16.70
Rea	Pennsylvania	158	Freshmen only	20.00
Scott	Smith College	Not given	Class of 1913 Class of 1923 Class of 1931	56.00 31.70 32.40
Bell, Parsons and Schutz	Michigan	4,068 1929-1931	Slight pain Severe pain	38.00 11.00
Bell and Parsons	Michigan	840 1931-1932	Severe pain	12.00

No relief was obtained from the irradiation of the pituitary region in four, and of the ovarian region in two. It suffices to say that the indictment for hasty surgery is clearly expressed in these figures and needs no further comment.

It has often been said that if a woman marries she finds relief from menstrual distress because of regular sex relation. This is not always correct. In the figures presented next, the age of greatest sex activity also shows the greatest number of patients subject to severe dysmenorrhea.

In this series fifty-two patients were single, and seventy-eight married.

	Under 20	20 to 29	30 to 39	Over 40
Single	10	31	9	2
Married	1	56	20	1

It is also interesting to note here the low incidence of pregnancy: of the seventy-eight married women, only nine had been pregnant, of which seven had carried a child to term, one woman twice. It has been repeatedly pointed out that this form of dysmenorrhea and functional sterility go together because of failure of normal development of the uterus, and the frequently present functional failure of the ovaries. The latter fact is probably more important than the former, because functional disorders of the ovaries often explain infertility and nearly always go together with marked irregularities in menstruation. Failure in uterine development alone is not necessarily accompanied by menstrual disorders, and does not necessarily preclude sterility.

An attempt at correlation between the severity of pain with the type of the uterus, the body type, the psychogenic constitution, or the various manifestations of menstruation ended in failure. Whatever the results were for a given grouping could be matched by similar results in a group showing normal characteristics. In grouping pain, for instance, I found that it was severe in 20, incapacitating in 110, 48 of which had to go to bed for from 6 to 48 hours, with 33 experiencing nausea and vomiting for from 6 to 36 hours; 65 had pain for one day only, 53 for 2 days, 4 for 3 days, 6 for 4 days, and 2 for 5 days. Fifteen had premenstrual pain for from one to seven days, but none had postmenstrual pains. Then I classified the patients according to body type, and recorded 87 as normal, 14 as obese due to anterior pituitary insufficiency, 5 as obese due to hypothyroidism, 13 as thin or asthenics, 10 as eunuchoids, 4 as boyish or infantile, and 2 as hyperthyroids. Similarly, on a basis of psychogenic constitution, I classed 87 as normal, 15 as hyperesthetics and 28 as emotionally unstable, and finally I grouped the development of the uterus as follows:

Type of Uterus	Normal	Hypoplastic	Infantile	Hypertrophied
Single	16	18	11	5
Married	32	26	8	14

With this I noted also 24 retroversions, 13 mild cases of cervical irritation, 15 patients with tender or spastic uterosacral ligaments, 5 with congenital erosions, 3 with acute anteflexion, 4 with intrapelvic varicosities, and one with a chronic appendicitis. I then tried to link the type of the uterus with either degrees and days of pain, but again was confronted by the fact that the normal uterus was just as often associated with as severe a type and as great a duration of pain as occurred with any of the other three types of uteri recorded. Likewise, the length and duration of the menstrual cycle could not be linked with any of the other observations. There are the usual irregularities in all groups with about 40 per cent of the patients menstruating approximately four to five days every twenty-eight days.

PSYCHOGENIC MAKE-UP

Next an attempt was made to correlate the psychogenic make-up with pain appreciation. Among the eighty-seven normal individuals there were proportionately more severe cases of pain than among the emotionally unstable, although the fifteen patients classed as hyperesthetics all suffered severely, and longer than any number of the other two groups. It cannot be denied that certain individuals, because of functional nerve disorders, suffer more than others; but I am not willing to accept that the vast majority of dysmenorrhea is of psychogenic origin, as certain German observers would like us to believe. In Boynton's [4] report attention is called to the fact that the high-strung individuals among the 2,282 students

studied showed dysmenorrhea less frequently than those of a normal control group. I have come to the conclusion that all attempts at correlating given factors observed in connection with intrinsic or primary dysmenorrhea are futile. Cunningham and Boynton, both studying large numbers of students, concluded that dysmenorrhea cannot be linked with changes in posture, physical exercise, minor infections, visual disturbances, and climatic changes. Most writers, on the other hand, agree that constitutional inferiority often is associated with menstrual pain. This is also true of the small series presented here, as pointed out above.

PRIMARY DYSMENORRHEA

There have been many theories advanced to explain primary dysmenorrhea. When T. B. Sellers [11] canvassed a large group of gynecologists in regard to their ideas on this subject, he received a sufficient variety of answers to fit almost any theory. The old dictum of Sims, nulla dysmenorrhea nisi obstructiva, apparently still has a great number of followers. Sixty-four per cent of the answers Sellers received gave congenital cervical stenosis as the actual cause for essential dysmenorrhea. This has been disputed by careful observers. E. Novak [12] tried to disprove the claim of Sims by the introduction of the "probe test": he reported that during the menstrual flow in dysmenorrhea, one could introduce a reasonably large uterine sound past the internal os of the cervix without finding any obstruction. Personally, I do believe that a spasmodic cervix or a cervix unable to relax under the stress of menstrual congestion because of a congenital imbalance of connective tissue and musculature could explain the pain produced. The amount of blood that normally flows through the cervical canal per minute is very small and perhaps no factor. Since dysmenorrhea is common with normal uteri, the inability of the cervical and uterine tissue to relax under the strain of congestion suggests itself as the more important factor. In this series, forty-eight, or about 27 per cent, of the patients possessed normal generative organs. The developmental disturbances in the size or position of the uterus do not offer a satisfactory explanation. Miller's [13] theory of poor posture and poor muscle tone has been answered by Boynton [4] in the negative. Disturbances in the vegetative nervous system, as explained by J. Novak and Harnik,[14] can be linked up with the studies of Blotevogel and Poll,[15] Kennedy,[2] Fontaine and Herrmann,[3] and the preceding group of investigators studying the results of pelvic sympathectomy. Their conclusions deal with the most tangible part of the mechanism of pain production. In connection with this, one should also consider Schultz's theory of venous stasis, and E. Novak and Reynold's [12] theory of muscular irritability in the case of a disturbed estrinprogestin balance. That ovarian hormones do influence the development of the uterus in the presence of a still existing growth stimulus is fairly well established. Blotevogel,[15] Kennedy,[2] and others have also shown that ovarian hormones, and particularly estrin, are capable of stimulating an atrophic ganglion of Frankenhäuser to regeneration. The final answer to the question whether the influence of ovarian hormones or any other hormone is exerted directly onto the uterus, or to the nervous mechanism of the uterus, has not been given. All we know today is that, in selected cases, organotherapy effectually relieves dysmenorrhea. There are those who, like Clow,[16] disclaim any result from organotherapy. Mazer and Goldstein [17] lay this to either inactive materials or to insufficient dosage. Any mechanical method of treatment for dysmenorrhea which offers permanent improvement or complete relief must, above all, succeed in relieving irritation of the nervous mechanism of the uterus. How this is accomplished I do not know, except that a marked relaxation and softening occurs in the uterosacral and broad ligaments after stimulation of the uterus by certain electric currents, in particular galvanism. Adherents to the Brand method of pelvic massage claim the same results. In selected cases properly fitted stem pessaries or slow dilation of the cervix occasionally may give relief, but have not been particularly successful in my own experience.

TREATMENT

In undertaking the treatment of dysmenorrhea one should aim to take all possibilities touched upon into consideration. It goes without saying that, above all, we should improve the physical and mental condition of our patients, if that is necessary and possible. For the latter it is sometimes necessary to provide the patient with an effective anodyne to break the fear of another painful and distressing menstruation. Next we should aim at improvement of the uterine condition. I have found that in hypoplasias and in infantile types of the uterus the intracervical application of negative galvanism is very effective, both as a relaxing agent and as a stimulus for muscular development. At the same time we should aim to correct such endocrine defects as our present knowledge permits us to do. In the presence of spastic uterosacral ligaments which most likely are due to unrecognized cervical irritation, hydrotherapy and the use of detergent suppositories will frequently solve the problem. Sex matters must be discussed and regulated. In fact, prior to undertaking the treatment of dysmenorrhea the patient should be studied purely from a medical point of view, and all systemic disturbances should be corrected. If all measures fail, the patient may have to be subjected to more radical measures. If a displacement of the uterus is considered to be the underlying cause, certainly no suspension should be undertaken unless the patient has been tried out with a well-fitting vaginal pessary. If this rule is not followed the patient will join the army of the uselessly operated, of which I presented a fair contingent in the beginning of this report. If dilation of the cervix by galvanism does not bring relief, mechanical dilation with graduated dilators will be equally unsuccessful. I have come to the conclusion that if all measures fail, one should then attempt to block Frankenhäuser's ganglia according to the method of Blos,[18] using 70 per cent alcohol con-

TABLE 2.—*Results*

Method of Treatment	Number Patients	Relieved	Improved	Failure
Galvanism alone	33	18	9	6
Glycerin extract ovary	26	2	15	9
Estrogen, theelin, amniotin	12	2	4	6
Theelin and thyroid	3	1	2	..
Thyroid alone	18	8	6	4
Theelin and galvanism	12	6	4	2
Hydrotherapy, vaginal suppositories	20	10	9	1
Cauterization of cervix, suppositories	6	4	2	..
Total	130	51	51	28
Percentage		39.23%	39.23%	21.54%

taining 5 per cent novocain. This method is certainly as rational as that used for trigeminal neuralgia: it will not interfere with the motor function of the uterus or bladder, and can be carried out in the office, but requires dexterity and a good knowledge of pelvic anatomy. It is about as successful as resection of the presacral nerve, and decidedly simpler and less expensive for the patient. My own experience with this method, as well as with sympathectomy, is still limited, but the results have been uniformly good.

It is decidedly difficult to select patients for a given treatment according to fast rules. I have followed as closely as possible the outline. I have given in the previous paragraph. Frequently it has become necessary to combine treatments or to resort to a different form of treatment when the previous one has failed. Hygiene and psychotherapy perhaps play a more important rôle in obtaining relief than one can estimate. Whatever other measures were employed are outlined in Tables 2 and 3.

Of the twenty-eight failures, ten submitted to more radical treatment and eighteen did not return.

The percentage of failures was, therefore, ultimately reduced to 16.92 per cent. The amount of improvement recorded was sufficient to allow the patient to continue with her respective occupation without serious hindrance. All patients were followed up over sufficiently long periods to obtain accurate information as to the permanency of the result. In the group treated by galvanism more than half showed some form of mild recurrence, which brought them back for further treatment out of their own volition; this, I think, is sufficient proof for the efficacy of the method. The failures in organotherapy, particularly with the glycerin extract of the ovary marketed by Schieffelin & Company, can be explained by insufficient dosage, since this preparation is not standardized; although I am convinced that it contains potent follicular hormone, judging from clinical results I have observed in the treatment of oligo- and hypomenorrhea. Failures with the standardized preparations may also mean insufficient dosage or inaccurate application of the principle involved. Thyroid therapy was not based entirely on the recorded basal metabolic rate, but on clinical phenomena such as lack of endurance, sluggishness, myxedematoid skin, and overweight. It was found that in this group a number of patients could tolerate much larger doses than would be expected from the laboratory findings and, in fact, did not report improvement until the individual tolerance had been ascertained. It is very interesting that a number of patients could be relieved by hydrotherapy, particularly hot baths during menstruation, and sedative vaginal suppositories. The use of the latter was begun a week before the expected period, and was continued through the period. This method was most frequently used when spastic uterosacral ligaments were present. The suppository used is a commercial preparation containing acetanilid, sodium borate, zinc borate, hydrastin in glycerogelatin. I make no claims for either of the ingredients, but from observations in the treatment of pelvic inflammatory disturbances I can state with certainty that these suppositories bring relief from pelvic distress. When using estrin containing substances I have always attempted to simulate the gradual increase of estrin production normally occurring with ovulation. It was therefore necessary to work out a scheme for each patient according to the known menstrual interval. When using the glycerin extract of the whole ovary, medication was carried into the menstruation, since this substance is supposed to contain a lutein factor. When using the pure follicular hormone, the maximal dose was reached about two days before the expected flow, and the patient was instructed

TABLE 3.—*Results*

Method of Treatment	Number Patients	Relieved	Improved	Failure
Stem pessary after dilation	3	..	..	3
Suspension of uterus	1	1	..	..
Suspension and resection of presacral nerve	2	2	..	..
Appendectomy	1	..	..	1
Nerve block by alcohol injection	3	2	1	..
Total	10	5	1	4

to discontinue treatment at that period; no active progestin containing preparations being commercially available, this scheme was thought to be the most logical. Of other endocrine substances used in the treatment of dysmenorrhea, Collip's emmenin has attracted some attention. I have no personal experience with the preparation. It has been used at the Stanford Women's Clinic with eleven patients. Doctor Fluhmann was kind enough to tell me that six patients were definitely relieved, two were improved, and three experienced no relief whatsoever. Collip's emmenin (Eli Lilly & Company) is an estrus-producing hormone soluble in alcohol, administered orally. Failure of results may again be due to the insufficient dosage or to faulty application of this substance.

Dosage.—The question of dosage for ovarian hormones does not so much rest with our inability to arrive at the required dose, as it does with the tremendous expense involved when large amounts have to be given. It is for this reason that I have resorted to the use of the unstandardized glycerin extract of the whole ovary.

Operative Procedures. — Among the operative procedures, stem pessaries failed me completely and I have given up their use. There is a great deal to be said against operative procedures for the relief of dysmenorrhea of the primary or essential type. I again call attention to the great number of surgical failures recorded in the earlier part of this report. In Europe sympathectomy has gained a great deal of favor, particularly among the French and Italian gynecologists. This operation is not easy and consequently often outside the reach of many casual surgeons. The alcohol block advocated by Blos [18] is certainly more simple, equally efficacious and inexpensive for the patient.

There are undoubtedly a great many other ways of treating primary dysmenorrhea. Because of our complete lack of knowledge of the actual mechanism involved, treatment must be empirical to a degree. Nevertheless, a serious attempt at analyzing the individual patient promises a far better result for improvement or complete relief than the mere acceptance of one method to be used for all patients suffering from this disturbance.

CONCLUSIONS

Of 4,500 consecutive patients of the intelligent class only 130 were found to suffer from primary or essential dysmenorrhea. Nearly one-third of them had previously submitted to surgical procedures without relief. A careful analysis of the individual patient and the application of sound principles of conservative treatment relieved or improved about 80 per cent sufficiently to permit them to carry out their duties without hindrance. Among more radical measures nerve block by alcohol injection of the uterocervical ganglia of Frankenhäuser offers the simplest solution.

2000 Van Ness Avenue.

REFERENCES

1. Cotte, G.: Lyon chirg., 29:112, 1932; ibid., 29:252, 1932.
2. Kennedy, W. P.: Edinburgh M. J., Trans., 36:75, 1929; Brit. M. J., 1:746, 1932.
3. Fontaine, R., and Herrmann, L. G.: Surg., Gynec., and Obst., 54:133, 1932.
4. Boynton, R. E.: Am. J. Obst. and Gynec., 23:516, 1932.
5. Cunningham, R.: Proc. Am. Student Health Assn. Bull., 15:84, 1931.
6. Rea, M. H.: Proc. Am. Student Health Assn. Bull., 15:65, 1931.
7. Scott, F. K.: Proc. Am. Student Health Assn. Bull., 15:70, 1931.
8. Bell, M., Parsons, E., and Schutz, E.: Proc. Am. Student Health Assn. Bull., 15:77, 1931.
9. Bell, M., and Parsons, E.: Med. Women's J., 38:31, 1931.
10. Schröder, R.: Veit-Stoeckel, Handb. der Gynäk. Münich, 414, 1928.
11. Sellers, T. B.: South. M. J., 25:167, 1932.
12. Novak, E., and Reynolds, S. R. M.: J. A. M. A., 99:1466, 1932.
13. Miller, N. F.: J. A. M. A., 95:1796, 1930.
14. Novak, J., and Harnik, E.: Med. Klin., 25:251, 1929.
15. Blotevogel, W., and Poll, H.: Med. Klin., 23:1503, 1927.
16. Clow, A. E. S.: Brit. M. J., 1:4, 1932.
17. Mazer, C., and Goldstein, L.: Clinical Endocrinology of the Female, 313. Philadelphia. 1932.
18. Blos, D.: München Med. Wchnschr., 76:1173, 1929.

DISCUSSION

Clifford A. Wright, M. D. (2417 South Hope Street, Los Angeles).—Dysmenorrhea, as explained by Doctor Emge, is a very difficult condition to treat successfully, and this is reflected in the great number of patients who come to our offices having had considerable treatment, including surgical procedure, without results. The cause of the irregular results of treatment of dysmenorrhea is probably due to lack of more definite knowledge as to its etiology. As stated by Doctor Emge, this condition is like headache, being a symptom and not a disease entity, and undoubtedly can have a variable etiology. Most authors agree that abnormal contractility of the uterine muscle is the probable cause of the severe pain, and in a goodly percentage of cases this in turn may be due to endocrine factors. I am particularly interested in the endocrine phase of this condition, and when we consider, as explained by Doctor Novak in the *American Journal of the Medical Sciences*, February, 1933, that folliculin produces contractions of the uterine muscle and that progestin, and the urine of pregnant women, inhibits them; and also, as explained by Mazer and Goldstein, that estrin or folliculin apparently sensitizes the uterus to the action of pituitrin, the endocrine basis for the etiology of many cases of primary dysmenorrhea is logical. In Doctor Emge's group of 130 patients, thirty-five, or approximately 27 per cent, were definitely endocrine in type. Also of significance is the fact that in my endocrine cases of the menstrual age, 70 per cent had menstrual irregularities. Many women with dysmenorrhea have normal pelves. We may see dysmenorrhea in hypo-ovarianism, hypopituitarism, and occasionally in hyperthyroidism, but practically never in pure hypothyroidism. From an endocrine standpoint, the treatment would depend on the type of individual under consideration. Undoubtedly the use of a luteinizing principle, as that derived from pregnancy urine, should give results in many of these cases.

*

John W. Sherrick, M. D. (350 Twenty-ninth Street, Oakland).—Dysmenorrhea is one of the most difficult therapeutic problems in gynecology; and because of its frequency and its incapacitating effects (it is estimated that 90 per cent of women experience some disturbance, and in at least 50 to 65 per cent it interferes with their daily routine) it is a very practical problem. It is, likewise, a most discouraging problem. It is particularly gratifying to have Doctor Emge's

explanation of the production of pelvic and reflex pain through disturbance of the intricate sympathetic nerve supply of the pelvic viscera, and his sane and comprehensive review of the whole subject.

Of the two types of dysmenorrhea, primary or intrinsic, and secondary or extrinsic, the former is the more important because of the difficulties it offers as to etiology and treatment. The extrinsic type, being associated with and due to obvious pelvic pathology, is relieved usually by treating this pathology.

Intrinsic dysmenorrhea is often a very difficult problem, and of the numerous theories offered in explanation no one is sufficient. Of these, one recalls the following: congenital stenosis of the internal os; narrowing of the internal os by premenstrual swelling of the endometrium; developmental irregularity between the uterine musculature and connective tissue elements with the venous congestion of menstruation, causing painful stimulation of the nerves of the uterus; genital hypoplasia with long conical cervix, acute anteflexion, narrow internal os, tissue defects, etc.; deficient uterine and sacro-uterine ligament elasticity, narrow cervix and lower segment with deficient adaptability to menstrual congestion; chronic pelvic congestion from any cause, as overexertion, abnormal or prolonged sexual excitement, fatigue, constipation, faulty hygiene, etc., especially in the presence of the proper local and general background; abnormal physical and nervous unbalance and irritability, the so-called constitutional inferiority and psychogenic type, with lowering of the threshold of gain; endocrinopathies, thyroid, folliculin and progestin disbalance, etc.

No one of these theories furnishes a basis on which all cases of intrinsic dysmenorrhea can be treated. One must evaluate each case on its own merits and approach treatment largely from an empiric standpoint. Certain general measures are useful in all, as rest; heat in various forms; coal-tar derivatives, alone or combined with the barbiturates; codein, atropin to the point of tolerance; adjustment and control of the mode of life (adequate rest, sleep, relaxation, exercise, avoidance of too much social strain, etc.); bowel control; an adequate nourishing diet; correction of mental attitude; regulation of sex life, etc. In many cases we find marked benefit from the stimulating and relaxing effects of electrical dilatations. Some respond favorably to correction of endocrine defects—thyroid therapy, the use of estrin or antuitrin "S" or follutein, progynon, etc. Many cases fail to respond to all forms of therapy. We have not resorted to section of the sympathetic nerves or to alcoholic injection of the uterocervical ganglia. I feel, too, that we have not made sufficient use of hydrotherapy and sedative vaginal suppositories.

*

Ruby L. Cunningham, M. D. (University of California, Berkeley).—As a member of the Student Health Service staff of the State University, I have had abundant opportunity to be perplexed as to the cause of dysmenorrhea and concerned as to its most effective treatment.

In an attempt to link painful menstruation with evidences of nutritional disturbance, or with dysfunction of the glands of internal secretion, a study was made of 14,268 young women who entered the University of California from 1920 to 1929. It was found that the group who have menstrual pain differ from the group who do not have pain, in three ways: more of them are underweight, more have a low blood pressure, and more are far-sighted. Doctor Boynton, of the Student Health Service of the University of Minnesota, adds to this list low hemoglobin determinations.

Poor nutrition, secondary anemia, and low blood pressure are evidences of constitutional inferiority noted by many observers and spoken of by Doctor Emge.

Young women of optimum weight for age and height, with blood pressures normal or above average, with satisfactory hemoglobin determinations and normal vision, often suffer severe menstrual pain. Those with marked evidences of constitutional inferiority may have no pain. Dysmenorrhea cannot then be considered to be the result of constitutional inferiority. Pain with menstruation may lessen appetite, even cause nausea and vomiting, and thus contribute to malnutrition and anemia.

In the study of the University women, there was no evidence that glands of internal secretion other than those of the reproductive system are responsible for menstrual pain.

Fortunately, many cases of dysmenorrhea respond favorably to improvement in general health, to increase in exercise, to the use of antispasmatic drugs and products of the endocrine glands.

When medical therapy fails we turn to surgery. Too frequently surgery also fails to give relief and, in addition, is destructive. Doctor Emge has outlined a conservative method of attaining relief from pain which, pending the day when the cause of dysmenorrhea is clear and its medical therapy or its successful prevention possible, should find frequent application.

It is to be regretted that the uterocervical ganglia of Frankenhäuser is difficult to locate and to inject, and that for this reason this form of treatment must remain in the hands of the few skilled in its application.

BISMUTH INJECTIONS IN THE TREATMENT OF WARTS*

REPORT OF BISMUTH INJECTIONS IN THE TREATMENT OF SIXTY-ONE CASES OF WARTS AT THE COWELL MEMORIAL HOSPITAL OF THE UNIVERSITY OF CALIFORNIA

By C. J. Lunsford, M. D.
R. R. Thomson, M. D.
G. W. Binkley, M. D.
and
D. S. Fox, M. D.
Oakland

Discussion *by Sophie A. Lurie, M. D., Los Angeles; Samuel Ayres, Jr., M. D., Los Angeles; Stanley O. Chambers, M. D., Los Angeles.*

A RECENT article† by Dr. Sophie A. Lurie gave the results of treatment of verrucae by intramuscular injections of bismuth salicylate. A total of forty-nine patients were treated, of whom five were adults and forty-four were children. The technique of treatment was, in the beginning, weekly intragluteal injections of bismuth salicylate in doses appropriate to the age of the patient. Subsequent injections were withheld until such time as the regression observed had become stationary. The largest number of injections given was nine, and that in only one case. The statement was made that of the thirty-four cases observed over a sufficient period of time, the warts completely disappeared in all.

Among the students attending the skin clinic at the Cowell Memorial Hospital of the University of California at Berkeley, as well as in other clinics, we come in contact with many cases of warts. We have used all the modalities available in the treatment of such cases, and have felt that none of them were entirely satisfactory. Therefore, in the presence of such a problem, we read the article by Doctor Lurie with unusual interest:

* Read before the Dermatology and Syphilology Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

† July 1932 issue of the *Archives of Dermatology and Syphilology.*

certainly if a few intramuscular injections of bismuth salicylate would solve the wart problem, we felt that a contribution of real value had been offered to the profession.

We placed a total of sixty-one cases of warts under treatment with bismuth injections. In fourteen of these patients, treatment was discontinued because of illness, local pain, interference with work, and lack of coöperation; of the remaining forty-seven cases thirty-nine were adults and eight were children. Thirty-seven of the adults were given intramuscular injections of one cubic centimeter of bismuth salicylate (Lilly) into the gluteal region at weekly intervals. Two adults were given the same dose of Lilly's bismoid. The eight children were given one-half the adult dose of Lilly's bismoid. The location in the majority of cases was the hands and feet. There were cases, however, of involvement of the face, vermilion border of the lips, and penis.

ANALYSIS OF CASES AND RESULTS OF TREATMENT

Of the total of thirty-nine cases in adults which coöperated, eleven were cured and twenty-eight failed to be cured. The percentage of cure was 28.2 per cent. Of the eight children who coöperated, four were cured, and in four there was failure. The percentage of cure was 50 per cent. (See Table 1.)

TABLE 1

	Total	Clinically Cured	Failed	Results
Adults	39	11	28	28.2%
Children	8	4	4	50%

Adults who were clinically cured received from one to sixteen injections of bismuth, with an average of 5.5 injections each. An average of 7.5 injections were given in those cases in which treatment failed, the greatest number being fourteen. The children who were clinically cured received an average of ten injections, and one received as many as twenty-two. In those cases in which failure was noted, the average number of injections was 7.7 (see Table 2). The greatest number of injections was twelve. Two adult patients were cured after one injection each.

COMMENT

In a few patients, a mild inflammatory reaction occurred about the wart after the first several injections had been given. Such reaction was not always followed by clinical cure. In some of the plantar warts, pain disappeared without a clinical cure. In two cases of failure new warts developed after the twelfth injection of bismuth. In many cases of failure through the entire course of treatment, the warts already present continued to increase in size. Analysis of the cases, from the standpoint of number or site, was without sufficient significance to justify classification. We were unable to observe any clinical features in the cases which were treated successfully which might serve as a criteria of choice in selecting other cases for further bismuth therapy.

TABLE 2

	Cured	Failed
Adults average number of injections	5.5	7.5
Children average number of injections	10	7.7

CONCLUSIONS

The 50 per cent of cure in eight cases in children and the 28.2 per cent of cure in thirty-nine cases of adults would indicate that bismuth therapy has a limited place in the treatment of verrucae vulgaris. One would be justified in trying it in such cases as multiple warts on either hands or feet. Other cases where such treatment might be utilized would be washerwomen, surgeons, nurses, or children, where destructive measures are for any reason contraindicated.

3115 Webster Street.

DISCUSSION

SOPHIE LURIE, M. D. (1026 Story Building, 610 South Broadway, Los Angeles).—I am happy to learn that our attempt at research in the lines of treatments of verrucae vulgares gave impetus to dermatologists to continue our observations. Considering the findings and comments of the authors of the paper, I presume that their observations have not been carried out for a sufficient length of time; I mean that some of their demerits I consider as positive steps to the regression process. They say, for example, "In some of the plantar warts pain disappeared without a clinical cure. In two cases of failure, new warts developed after the twelfth injection of bismuth. In many cases of failure, through the entire course of treatment the warts already present continued to increase in size."

The first symptom of response to treatment is cessation of pain. Because some of the plantar warts are sitting very deeply, it takes a long time to bring them out to the surface. Therefore, while being treated, those which are located deeper come out later; and this feature I consider, not as a failure, but as a step to progress: finally, they come out to the surface, go through the cycle of their regression and entirely disappear. I had cases where I had diagnosed at first one or two warts on the ball of the foot which gradually increased until I counted a dozen. The pain became worse while the warts approached the surface, but it disappeared as the warts regressed. I had another case lately of one wart on the volar aspect of the great toe. After the first treatment, the whole volar area was covered by minute hemorrhages, and this meant that minute warts were seated more deeply and could not be seen by the naked eye. They responded immediately, however, to treatment: after two applications, three weeks apart, the patient was cured.

The next point of the commentators "that in many cases of failure through the entire course of treatment the warts already present continued to increase in size," should be noticed. Sometimes it is remarkable to see how a wart, especially a plantar one, which is on the level with the skin, mostly cornified, becomes elevated and enlarged. This is one of the positive signs of success. I have seen a case where the wart appeared one centimeter above the level of the skin and each papilla occurred as a transparent, jelly-like digitation with a reddish, tender, thread-like screw inside (terminal vessel). Considering the clinical features, the most striking one is bleeding: sometimes the warts bleed profusely after the treatment is begun. One Japanese boy, ten years old, had a wart the size of a split pea on the lower lip, on the border of the skin, but not extending above its surface. After the first treatment the wart protruded, became hemorrhagic, and reminded one of pyogenic granuloma; gradually it contracted, and then diminished to a

nearly invisible size. The boy is still under observation. I believe that the tendency of the blood vessels to become engorged and to produce a hyperemia is the fundamental basis for the success of the treatment. This phenomenon did not occur so extensively in all cases. In those sites where the vascularization is richer, this feature is more pronounced. But in every case, nevertheless, we see how the wart becomes soft and easily movable, as if lubricated, indicating that the nutrition is improved; and, as a fact, the papillae get larger, and appear higher above the surface. And I presume that the result of the engorgement by the blood forms some local defensive bodies which confront the virus.

I observed another feature, especially on the plantar warts, when they became calloused. Because the process of involution starts underneath, we try to remove any obstacle of pressure to make more room for the dilated vessels inside the growth and thereby diminish the pain. The patient is ordered to apply for a few days 15 per cent salicylic acid in flexible collodion, and afterward we begin the intramuscular treatments. When children come with infected warts, we treat the secondary infection first and continue with bismuth. We had prompt results in verrucae planae. The effect of treatments among children is more spectacular than among adults.

Some authors have said that by fulgurating one wart the rest of them may be made to disappear sympathetically. I fulgurated a wart on the right little finger which seemed to me to have entirely disappeared. A few months later a wart reappeared on the same site, with a crop of others, smaller in size, on the other fingers. They remained there for one and one-half years, while I experimented with the bismuth salicylate intramuscular injections. Then I tried these injections on those warts. After four treatments they have entirely disappeared. The patient is a nurse whom I meet often, when I check up the state of her hand. So far she has had no relapses, and nine months have elapsed since the last treatment. I would differentiate two varieties of verrucae vulgares. In one group the ordinary warts, which consist of numerous hypertrophied, cornified papillae, respond to our treatment very promptly. The warts of the second group are wider, larger, convex, solid, pinkish in color, and the papillae are faintly seen. It seems as if minute granules top the growth. They are of longer duration, not painful. We have seen them only on the hands mostly in groups, coalescent. One of my private patients, an adult, had both kinds on one hand. The first type responded promptly; the second much more slowly; in general, this type disappears slowly. They involute in an entirely different manner. As soon as treatment is instituted the wart becomes thinner, and tiny, scaly débris come off. The involuting process continues slowly until a pinkish spot remains at the site of the wart, which gradually disappears entirely. We have never seen any bloody points as in the first type.

As various species of fungi and yeast infections give various clinical entities, we presume there might be different viruses of verrucae vulgares infection producing variations of the growth.

I wish to say a few words in regard to bismuth salicylate (Mulford's). In the beginning, three years ago, I started with this bismuth preparation because I used it routinely at the luetic clinic; but after our successful results I continued with it as with an insoluble preparation which produces deposits in the muscles, and the absorption goes on, I presume, more or less adequately. I desire to space the treatments as far apart as possible, and resume the bismuth treatments whenever the clinical picture indicates that it is necessary to do so.

In regard to the statistical data of the authors, I wish to say that I have had very few adult patients with warts; their response, as I mentioned above, is slower, while among children, so far, I have not had any failures.

I use only bismuth salicylate (Mulford's). Perhaps the brand of the bismuth also has some effect. I hope in the near future to control our clinical findings by the pathologic sections. Because of the fact that some investigators used gold and lead with some hopes of success in malignant growths, it may stimulate one to apply bismuth salicylate for the same reason.

In closing I wish to express my deep appreciation to Dr. Samuel Ayres, Jr., for his encouragement in our study and his first endorsement of our findings, as the chief of the medical staff of the Parents and Teachers Yale Health Center in Los Angeles; and I also wish to thank Doctors Lunsford, Thompson, Binkley, and Fox for having been so kind as to ask me to discuss their paper.

❦

Samuel Ayres, Jr., M. D. (2007 Wilshire Boulevard, Los Angeles).—I have followed Doctor Lurie's pioneer work in this new treatment for warts with a great deal of interest. I have collected a series of seventy-one cases of warts, including several varieties in which bismuth was administered intramuscularly. My statistics lie approximately midway between those of Doctor Lunsford and his collaborators, on the one side and those of Doctor Lurie on the other. My results are better than Doctor Lunsford's, but not so good as Doctor Lurie's.

This series of seventy-one cases represents patients in whom the condition could be followed for more than two or three weeks. The results can be described by means of a table.

	Per Cent
Cured or greatly improved	54
Improved	15
Unimproved	29
Total cases	71

Of these there were twenty-seven cases in children, with 55 per cent cured or greatly improved, and forty-four cases in adults, with 54 per cent cured or greatly improved.

There were eight cases of juvenile flat warts, with 62 per cent cured or greatly improved, and six cases of follicular warts, in the bearded area, with 66 per cent cured or greatly improved.

Various types of bismuth were employed; bismuth salicylate (Parke-Davis & Company) was probably used most frequently. Many cases were cured within from one to five doses. The patient receiving the largest number of treatments was a rather heavy woman, with several large warts underneath the thumb nail. She received twenty-four injections with no benefit whatever, but finally responded to applications of radium.

According to my observations, warts which respond to treatment, especially those on the soles, undergo a color change, becoming rather purplish or slate gray. They then undergo a crumbling process, so that they can easily be picked out, leaving an empty pit.

In spite of the fact that the majority of my patients (54 per cent) responded to this mode of treatment, I am reserving it, like Doctor Lunsford and his coworkers, more and more for cases of multiple warts, or single warts in which local treatment is contraindicated. So many cases require a fairly large number of doses that the individual becomes somewhat impatient. It is far simpler in cases of one or two warts to employ carbon dioxid snow, or moderate doses of radium, or the x-ray. I consider the bismuth treatment of warts, however, as a very valuable contribution to dermatological therapeutics.

❦

Stanley O. Chambers, M. D. (1260 Roosevelt Building, Los Angeles).—The administration of bismuth salicylate by intramuscular injection in the treatment of verrucae was advocated by Doctor Lurie more than a year ago.

It was our pleasure at that time to check her results clinically at the Los Angeles County General Hospital, Children's Hospital and Veterans' Hospital.

Our results in figures would agree with Doctor Lunsford's 28 to 30 per cent cures.

There is apparently no specificity to bismuth in the treatment of warts. This drug acts favorably in about the percentages that other drugs, such as neoarsphenamin and sulpharsphenamin do.

I can appreciate the effect on the observer who witnesses the clearing of warts, following the use of bismuth. It is indeed spectacular. This, however, is also true in the use of other drugs as well as age-old witchcraft. It would appear now specific.

There appears to be a mechanism as yet unexplained which accounts for the clearing of verrucae as well as their development.

Doctor Lurie should be complimented upon adding another agent, even though but partially effective, which adds to the patient's chance of recovery.

FEMALE BLADDER INJURIES INCIDENT TO SURGERY *

By WILLIAM E. STEVENS, M. D.
San Francisco

DISCUSSION *by Robert V. Day, M. D., Los Angeles; Lionel P. Player, M. D., San Francisco; Harry W. Martin, M. D., Los Angeles.*

INJURIES of the female bladder incident to surgery are probably more common than would be supposed from the infrequency with which cases are reported in the literature or are recorded on hospital charts. I found a record of but five cases of accidental injury of the bladder during operation in 53,254 admissions to the San Francisco Hospital. Hamer [1] quotes Graves,[2] who stated that only two cases occurred during 19,215 admissions to the Carney Hospital. This accident occurred three times during 1,086 pelvic operations in Stanford Hospital. Only those cases in which the bladder was incised or torn are included in these three series of cases. This complication is occasionally unavoidable, and has occurred in the experience of many competent surgeons.

OPERATIONS RESPONSIBLE FOR BLADDER INJURY

Injury of the bladder occurs most frequently during hysterectomy, salpingectomy, and oöphorectomy. It has also followed intravesical instrumentation, fulguration, and distention of the bladder with air or fluids, especially if the wall is already weakened by some pathologic condition. Curettage of the uterus, cesarean section, and instrumental delivery have likewise been responsible for serious injury to the bladder in many instances. G. Muller [3] reported a case in which, in addition to extensive tearing of the posterior bladder wall, the organ had also been torn away from the symphysis pubis, and the right ureter seriously damaged by a curette during an operative abortion. Damage to this organ is not uncommon when a portion is included in a hernial sac.

TYPES OF INJURY

Injuries are not limited to incisions, tears, punctures, ruptures or inclusion by sutures. Traumatism of the bladder and its attachments by rough handling, and necrosis following pressure from retractors, are occasionally responsible for postoperative symptoms. Later, distortion and displacement of the bladder, due to scar tissue resulting from the repair of vesicovaginal fistulas and to pressure or adhesions, are often responsible for interference with circulation, decreased bladder capacity and partial retention of urine with subsequent infection. Bladder symptoms are common following the transposition operation on the uterus; and this procedure has been abandoned by many surgeons. The most common sequelae of bladder injury are vesicovaginal, and abdominal fistulas and extravasation of urine.

REPORT OF CASES

CASE 1.—A married woman, fifty years of age, complained of attacks of pain in the left lumbar region, nausea and vomiting, following a transposition operation on the uterus six months previously. The bladder had been irrigated on numerous occasions because of pus in the urine. Persistence of her symptoms had caused her to return to the hospital several times for short periods. The urine contained an enormous number of pus cells. Cystoscopic investigation revealed an inflamed bladder mucosa, elevation of the vesical orifice, hypertrophy of the trigone, and a deep bas fond. A cystogram (Fig. 1) showed a large sacculation protruding from the lower right posterior wall of the bladder, and a pyelogram showed marked hydronephrosis with almost complete destruction of the left kidney. Improvement followed nephrectomy.

* * *

CASE 2.—A vesicovaginal fistula followed a forceps delivery. An unsuccessful attempt at intravesical repair was made one year later. A second intravesical attempt at repair during the following year was successful. Three months later a ventral hernia developed. This was repaired. A cystogram (Fig. 2) showed marked postoperative distortion of the bladder.

* * *

CASE 3.—A patient entered the hospital complaining of profuse intermittent bleeding from the bladder, beginning after sexual trauma seven weeks previously. Examination also revealed an abdominal sinus as well as several other sinuses in the gluteal region. She had undergone numerous operations, including suspension of the uterus and a bilateral oöphorectomy. A cystogram (Fig. 3) showed marked distortion of the bladder and a decrease in its capacity. The bleeding ceased a few days after the patient entered the hospital.

SYMPTOMS AND DIAGNOSIS

The female bladder is more sensitive to direct and reflex influences than that of the male, and disturbances of urination are very common following gynecologic procedures. Partial or complete retention of urine is usually found immediately after pelvic operations in this sex.[4] The symptoms associated with bladder injury are not infrequently puzzling and the diagnosis uncertain. This applies especially to those cases in which the injury has not been detected at the time of the original operation, and to those in which the injury has been discovered and the bladder wall apparently satisfactorily repaired.

REPORT OF CASES

CASE 4.—A hysterectomy was performed by a competent surgeon because of a large uterine fibroid. The bladder wall was thin and, with the peritoneum, closely adherent to the fibroid uterus, which extended upward to the umbilicus. In attempting to separate the bladder wall from the tumor, the base of the former organ was torn. The tear was closed with a continuous catgut suture. Six days later the patient complained of a slight cough, tenderness along the

* From the Stanford University School of Medicine.
* Read before the Urology Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

Fig. 1.—Distortion of the bladder following an interposition operation of the uterus.

Fig. 2.—Marked distortion of the bladder following two operations for repair of a vesico-vaginal fistula.

Fig. 3.—Marked distortion of the bladder following suspension of the uterus and bilateral oöphorectomy.

lower right costal margin anteriorly, and some pain on inspiration at the base of the right lung. Dullness on percussion, distant breath sounds, and some very fine râles were heard over this area. A diagnosis of pneumonia was made. Two days later the tenderness was more severe, some swelling was apparent in the kidney region, and the patient also complained of burning, frequent urination and pain in the right groin, worse on voiding. A catheterized specimen of bladder urine contained a large number of pus cells. Two hundred and forty cubic centimeters of residual urine were found. Cystoscopy revealed marked inflammation and edema of the bladder mucosa. The right ureteral orifice was not visible. Indigocarmin did not appear on either side within twenty-five minutes after intravenous injection. Operation was advised, but refused by the patient. Her condition gradually became worse, and one week later consent to operation was obtained. Following an oblique right lumbar incision, about 250 cubic centimeters of thick foul-smelling pus were evacuated. No pus was found inside the fatty capsule of the kidney. Some urine escaped through the wound for about six weeks after the operation. It was now possible to catheterize the right as well as the left ureter. The right kidney urine contained an occasional pus cell; the left was microscopically negative. Cultures from both showed colon bacilli. The patient made an excellent recovery after a prolonged convalescence.

* * *

Case 5.—A patient seen in consultation some time ago stated that urine had dribbled from her urethra since the removal of an abdominal tumor one and a half years previously. Examination revealed a vesico-vaginal fistula and urine dribbling from the vagina rather than from the urethra.

Tenderness in the suprapubic region, frequent urination, retention of urine, dysuria, and hematuria are common symptoms following most types of bladder injury. These symptoms are more apt to occur in the presence of a preoperative cystitis. The latter should receive appropriate treatment prior to gynecologic operations if possible. Extravasation of urine with subsequent infection is sometimes responsible for pain in the loins. This occasionally extends as high as the renal fossa in extraperitoneal injuries. When the opening is in the posterosuperior portion of the bladder, it usually communicates with the peritoneal cavity, and abdominal rigidity, as well as other symptoms of peritonitis such as nausea and vomiting, soon appear, especially if the urine is infected. Shifting abdominal dullness, due to urine in the peritoneal cavity, can sometimes be detected.

Intravenous urography is often a valuable diagnostic procedure when bladder injury is suspected. If this is not feasible, good cystograms may be obtained following the oral administration of sodium iodid as suggested by Osborne, Sutherland, Scholl, and Rountree [5] in 1923.

The advisability of injecting fluids into the bladder as a diagnostic procedure is questionable. It is not justifiable unless the surgeon is prepared to operate immediately.

TREATMENT

Recovery usually follows repair of the damaged bladder wall if detected at the time of injury. Later, if the symptoms are suggestive of bladder injury, or when in doubt, exploratory laparotomy is advisable. Delay in operating when the bladder opening is extraperitoneal, at best retards convalescence and often results in intense suffering. Intraperitoneal injury is usually rapidly fatal without operation. It may be permissible to postpone operation when there is sufficient drainage through an abdominal, rectal or vaginal fistula. The bladder wall should be closed with at least two rows of sutures, the first or deepest sutures being interrupted and including the entire wall with the exception of the mucosa. The other sutures may be continuous. A retention catheter should be inserted through the urethra and a urinary antiseptic given internally. If it is necessary to suture the bladder wall in the vicinity of the ureters, constriction of these organs should be avoided.

In the presence of extravasation of urine, free drainage is of the greatest importance.

The conditions following some types of bladder injury are often especially resistant to treatment. Many annoying postoperative symptoms would be avoided if infected bladders were appropriately treated prior to pelvic surgery.

REPORT OF CASES

Case 6.—A large rent was made in the fundus of the bladder during a hysterectomy and bilateral salpingectomy and oöphorectomy. It was closed with a

double layer of chromic sutures. The abdominal wall was then closed without drainage. A profuse mucoid discharge appeared nine days later. The wound was drained, and after a period of two weeks, or twenty-four days after the operation, it had completely closed.

* * *

CASE 7.—The bladder was accidentally opened during operation for excision of an old postoperative abdominal sinus and the freeing of a displaced uterus and bladder. It was closed with a double row of catgut sutures. A gutta-percha drain was placed in the space of Retzius. Two days later, however, urine escaped freely from the abdominal wound. Nineteen days after operation the wound had closed.

* * *

CASE 8.—An incision was accidentally made in the bladder during an operation for tightening of the sphincter, anterior colporrhaphy, proctopexy, and perineorrhaphy. The wound was closed with two purse-string sutures. A retention catheter was inserted. Convalescence was uneventful.

* * *

CASE 9.—The bladder wall was torn during a supravaginal hysterectomy. It was sutured and the abdominal wall was closed without drainage. The patient was catheterized every eight hours for the first four or five days. There were no postoperative symptoms.

* * *

CASE 10.—The bladder was incised during a hysterectomy. The injury was not detected. A vesicovaginal fistula followed. This closed after a third attempt at repair. One month later the patient entered the hospital complaining of pain in the left kidney region and bladder. Ureteral catheters encountered obstructions just inside both ureterovesical orifices, and x-rays showed several stones in the left kidney and a probable stone in the left ureter. The patient was uremic. The left ureter was opened, but no stone found. This was five and a half months after the last operation for repair of the fistula. Death occurred three weeks later. At autopsy, in addition to advanced bilateral pyonephrosis, both ureters were found obstructed by scar tissue resulting from the previous operations on the vesicovaginal fistula.

* * *

CASE 11.—In opening the peritoneum, preparatory to a right salpingectomy, oöphorectomy, the freeing of adhesions and an appendectomy, an incision about five centimeters in length was made into the bladder. This accident was apparently due to adhesions between the fundus of the uterus and the bladder, pulling the latter upward and forming a pouch. The incision in the bladder was immediately repaired and the abdominal wall closed without drainage. Convalescence was uneventful.

* * *

CASE 12.—In isolating the right uterine artery during a hysterectomy, salpingectomy and oöphorectomy, an incision about one centimeter in length was made in the bladder wall. This was immediately closed. Convalescence was uneventful.

COMMENT

Summary of the eight cases in which the bladder was accidentally torn or incised:

Bladder injury occurred during hysterectomy in two cases; during hysterectomy and salpingectomy, or oöphorectomy or hysterectomy and both salpingectomy and oöphorectomy in two cases; during salpingectomy and oöphorectomy in two cases; during tightening of the bladder sphincter, colporrhaphy, proctopexy, and perineorrhaphy in one case; and during operation for excision of a sinus following cesarean section and freeing of adhesions to uterus in one case.

The bladder wall was incised in five, and torn in three cases.

The injury was detected at the time of operation in seven cases, and not detected in one case.

The wound was sutured in the seven detected cases, one with drainage of the wound and one with drainage of the bladder through a retention catheter.

Convalescence was uneventful in four and prolonged in three cases. Death eventually resulted from the bladder injury in one case as a result of bilateral pyonephrosis due to scar tissue obstructing the ureters following several attempts at repair of a vesicovaginal fistula.

CONCLUSIONS

Urinary tract infection should receive appropriate treatment prior to operative procedures.

The bladder and its attachments should be handled carefully during pelvic surgery.

While no serious consequences follow repair of the bladder wall when detected at the time of operation in the majority of instances, exceptions to this rule are not uncommon.

Convalescence is shorter in patients in whom drainage is used.

Accidental operative injuries of the bladder are not infrequently responsible for prolonged convalescence, and they are occasionally fatal.

870 Market Street.

REFERENCES

1. Hamer, H. G.: Injuries of the Bladder Incident to Surgery, Transactions of the American Association of Genito-Urinary Surgeons, page 345, 1931.

2. Graves, R. C.: Dean Lewis Surgery, Vol. 8, Chapter 13.

3. Muller, G.: Injury to the Bladder, Ureter and Vagina in Artificial Abortion, Zentralblatt für Gynec., 56:331, 1932.

4. Stevens, William E., and Arthurs, Elizabeth: The Female Bladder, J. A. M. A., p. 1656 (Nov. 22), 1924.

5. Osborne, E. D., Sutherland, C. G., Scholl, A. J., and Rountree, L. G.: Roentgenography of the Urinary Tract During the Excretion of Sodium Iodid, J. A. M. A., 80:368, 1923.

DISCUSSION

ROBERT V. DAY, M. D. (1930 Wilshire Boulevard, Los Angeles).—Doctor Stevens has covered the subject so comprehensively and soundly that he has left little for anyone to add or contravert.

I wish especially to stress the effects on the bladder in many cases of the transposition or interposition operations. I have seen a number of unfortunate results following interposition operations done by men of undoubted skill, experience, and competency. Usually the base of the bladder is distorted, often presenting the picture of a mound pushing into the bladder base, accompanied with inflammatory infiltrate, ultimate infection and, in one case, superficial necrosis and bladder calculus.

In the operations of hysterectomy and on the adnexa, there are bound to be certain cases that tax the skill of the most experienced gynecologists, and no doubt an occasional accident involving bladder injury will continue to occur; and I think Doctor Stevens intends that these occurrences should be kept down to the minimum by exercising extreme care in their prevention. If immediately repaired and, for assurance sake, a very soft rubber drain is introduced down to the repair site, they almost invariably heal readily.

Injury produced by undue distention of the bladder with reflex retention postoperatively, mentioned casually by Doctor Stevens, is probably the most important trauma incident to pelvic (or other abdominal) surgery, and in the aggregate productive of infinitely

more dire results than all other forms of surgical trauma, from the standpoint of effects on the bladder. What is ordinarily called and supposed to be "catheter trauma" (almost always blamed on the nurse or the intern) is not catheter trauma at all, but the result of neglected postoperative overdistention. It occurs because the patient has not been catheterized soon enough, often enough, or over a sufficiently long period. That is to say, if there is any doubt about using the catheter, it should then always be used. Moreover, its use should not be discontinued just because the patient has begun to void. Such voiding is apt to be just overflow. In other words, intermittent catheterization should be continued until it has been actually demonstrated that the patient can empty the bladder when she voids. The method of instilling irritant drugs, such as mercurochrome solution, etc., on the theory (which sometimes works) that it will cause the patient to void, is a vicious and unjustified practice.

❦

LIONEL P. PLAYER, M. D. (384 Post Street, San Francisco).—Doctor Stevens' presentation is clear and concise. The small percentage of these surgical accidents reported is indeed surprising, especially in pelvic operations, where the proportion was three in 1,086 unselected cases. One could account for this fact in a measure, when he considers the extreme vascularity of the bladder wall, and might reasonably believe that small puncture wounds may be closed unknowingly; but sufficiently, when sutures or ligatures are applied to the bleeders, thereby preventing urine leakage.

Recognition at the time of injury, with proper suturing, drainage at and around the involved area, plus urethral indwelling catheter, is almost invariably effective and free from serious aftermath. The unrecognized cases due to any type of injury at operation, where the urine is infected or burrowing occurs along the deeper fascial planes with obscure symptoms, are serious, but respond to drainage. The great menace is presented when the peritoneal cavity is invaded with attendant peritonitis. In these cases the prognosis is grave, unless the condition is recognized and operated without delay.

In regard to the matter of retrograde cystographic studies, let me say that on several occasions I have not hesitated in accidental injuries to inject isotonic sodium iodid solution, if intravenous pyelocystographic media were not obtainable, with no ill effect.

Certain urinary antiseptics may be given intravenously when not tolerated by oral administration. The importance of free drainage by retention catheter, and at the site of injury, has been amply emphasized by the author.

❦

HARRY W. MARTIN, M. D. (6253 Hollywood Boulevard, Los Angeles).—As Doctor Stevens has stated, the incidence of bladder injury following operations is more frequent than has been reported.

A careful questioning of a number of gynecologists fixes the incidence of bladder injury at about one-half of one per cent. This may seem unusually large, but it will at least throw a light on the frequency.

I have seen two serious cases of necrosis of the bladder wall due to radium treatment of the rectum, and also two cases where the bladder was injured during a cautery operation in the abdomen.

As Doctor Stevens has stated, the majority of these cases have an uneventful recovery if the bladder is repaired immediately.

Too much stress cannot be made on the subject of appropriate treatment for urinary tract infections prior to surgery, and also gentle handling of the bladder and ureters during operations.

There have been seven cases in one of the large hospitals (five of whom were in males) where the bladder has been completely burned through by the use of the spark-gap current; and also several cases where the bladder has been ruptured, following the distention of the bladder with fluids by the syringe method.

TREATMENT OF NECK GLANDS IN CANCER OF LIP, TONGUE AND MOUTH*

A STUDY OF PRESENT-DAY PRACTICE

By OTTO H. PFLUEGER, M. D.
San Francisco

WHEN the Cancer Commission of the California Medical Association was formed, it undertook as its first problem a survey of the field of cancer, with the preparation of statements of the minimum requirements for adequate diagnostic and therapeutic procedures; this information to be made available to the medical profession in California. To this end clinical committees were formed to assemble the data concerning the various fields of cancer. It was felt that differences of opinion would undoubtedly arise in committee discussions but that these could be overcome in the laying down of acceptable alternate procedures.

As stated in the report of the Committee on Skin and Mouth Tumors,† an irreconcilable difference of opinion arose over the proper procedure of treatment to be followed in dealing with the lymph node bearing area in lip and intra-oral epitheliomata. It was possible to reach agreement upon the treatment of the primary lesion by suggesting alternate acceptable methods of procedure, men preferring one method, agreeing, nevertheless, that other methods are acceptable. Agreement was also reached upon the care of palpable lymph node metastasis, the consensus of opinion being that adequate surgical removal, together with irradiation, is the procedure of choice when the glands are operable. However, upon the question of whether dissection of the neck should be performed in the absence of palpable metastatic glands, it was impossible to reach agreement.

One group felt strongly that in cancer sufficiently advanced to suggest the probable presence of metastasis, for example, in lip cancer when invasion has reached the underlying muscle, the gland-bearing area should always be cleaned out surgically even though no glands could be felt. On the other side, opinion was just as strong that conservative care offered equally good results—such care being prophylactic radiation to the node area, with careful observation of the patient. If a node becomes palpable, dissection of the neck should be performed.

In the face of such irreconcilable difference of opinion, the Commission undertook to ascertain the present-day practice of cancer authorities throughout the world. Questionnaires were sent to forty surgeons, radiologists, dermatologists, and cancer clinics in Europe and America, to which thirty responses were received—constituting, we believe, a fair number for the basis of this discussion.

A questionnaire at best is not a perfect means of obtaining information, for the answering of

* Being a report by the secretary of the Committee on Professional Information of the California Medical Association, Cancer Commission.

† CALIFORNIA AND WESTERN MEDICINE, Vol. XXXIX, No. 2, p. 136, August, 1933.

one frequently calls for a good deal of qualification which is not stated. We feel, however, that the responses in general indicate the modes of treatment as carried out, though some variation may be made in occasional cases.

A tabulation and summary of the replies show that there is disagreement throughout the world corresponding to that of our own committee. The question, therefore, still remains to be settled, even though there is now a definite leaning toward conservatism in the absence of palpable glands. The present report is a detailed study of the replies received, and is concerned purely with procedures carried out by those replying, making no comparison of their mortality and cure-rate statistics.

A perusal of the accompanying tables will show that in only a few instances is the treatment varied by the correspondents according to the location of the primary lesion on lip, tongue, or buccal mucosa. In other words, the treatment of the glandular area is the same, regardless of the original site, except in a few instances.

GLANDS NOT PALPABLE

The source of the difference of opinion with regard to treatment of the glandular area, as mentioned above, is largely in those cases in which no glands can be palpated, the consensus of opinion when glands are palpable being that glandular dissection should be performed. In the former case we find that approximately two-thirds of the correspondents do not do routine dissection of the cervical nodes. This is a very definite trend toward conservatism. What are the reasons for this attitude, which is so different from the teaching of Halstead, who insisted on extensive dissection of the glandular area in all cases? In the first place, a large percentage of examined material from neck dissection shows no involvement of the glands by cancer, which means that an operation as extensive as a neck dissection has been unnecessarily done; furthermore, many cases of intra-oral carcinoma never do develop metastatic nodes during the course of the disease. Secondly, metastasis to the regional cervical nodes occurs by embolus and is limited usually to a single node or, at most, a limited group of nodes. These then act as sieves and filter out the emboli, providing a very definite protective mechanism, which is lost if dissection is performed before the primary lesion is adequately cared for. It is felt that the removal of a palpable gland, the capsule of which is not broken, offers just as much hope as the removal of an impalpable one containing a microscopic metastasis which will develop. It is stated also by some that many of these emboli do not give rise to secondary tumor growths, but are adequately disposed of by the lymph node. These appear to be the main reasons for conservatism, advanced by those who practice it. It must be apparent that this manner of treatment can only be undertaken with a patient over whom there is the closest control; one who can be observed at frequent intervals over a period of years. Furthermore, the patient must be warned of the possible development of a lump in the neck and told to report at the first sign of one.

Those who believe that dissection of the neck should be performed in all cases of intra-oral and lip carcinoma, even when glands are impalpable, have also definite reasons for doing so. The adequate treatment of cancer requires the removal of all malignant cells, and this can best be accomplished by excision of the tissue which is most likely to contain tumor cells, namely, the regional nodes, as early as possible, just as in the breast. Even though glands cannot be felt, metastasis may be present. Knowing that many of these cases are operated upon unnecessarily because no metastases are found on microscopic examination, it is felt, nevertheless, that operation must be done because it is impossible to determine beforehand which cases have involvement and which have not. The fact that a number of patients return with cured primary lesions and inoperable cervical nodes constitutes another reason for immediate operation. Another consideration is this, that in lip cancer without metastasis proper treatment gives nearly 100 per cent cures. If one gland is involved, cures average only 70 per cent, and with two or more glands involved the average cure drops to 40 per cent. If, then, a gland is involved but is not palpable, and one waits until it becomes palpable, it is then likely that there is not one but two involved glands, and the chances of cure have dropped from 70 to 40 per cent. The operative mortality of radical neck dissections alone (not suprahyoid dissection) is around 4 to 5 per cent.

It appears, then, that there is a difference of opinion throughout the world corresponding to that of our own committee, with regard to treatment of the neck in lip and intra-oral cancer when no nodes are palpable. There is, however, a definite trend toward giving radiation and pursuing a policy of watchful waiting rather than subjecting each such unfortunate individual to an extensive neck dissection.

RADIATION

We find from the responses that radiation plays a large part in the treatment of the glandular area. The majority of those who do not perform dissection of the neck when no nodes are palpable use external radiation by either x-ray or radium, or both. Thus, in cancer of the lip, out of twenty that do not dissect the nodes, fourteen irradiate the neck. In cancer of the tongue and buccal mucosa the percentage is even larger; eighteen out of nineteen in the tongue, and nineteen out of twenty-two in mucosa of the cheek cases. In both of these, three of them state that they irradiate some of the patients, but not all.

The kind of irradiation that is given may be of interest. Taking the tongue cases, it is noted that the responses are as follows: x-ray or radium (the latter preferred), two; radium alone, four; x-ray alone, seven; either x-ray or radium, two; both x-ray and radium, two; while one does not mention the type of irradiation used. These men use the same type for the other cases, when used at all.

The definite value of this so-called prophylactic radiation (so named when no glands are palpable)

CHART 1.—*Cancer of the Lip*

	Glands Not Palpable		Glands Palpable	
	Dissection	Other Treatment	Dissection	Other Treatment
1. Berven	No	Radium (preferably). X-ray also.	No, only if glands do not disappear with radium.	Radium by choice.
2. Burnam	No	None	Yes, bilateral suprahyoid and carotid glands with frozen section.	Preoperative
3. Cade	No	Radium	Yes	Postoperative. Preoperative occasionally.
4. Eller	No	X-ray	Yes	Preoperative and postoperative.
5. Grossmann	No	Radium or x-ray, as lesion is infiltrating or superficial.	Yes	Postoperative when glands involved.
6. Henry	No	External radium to desquamation always.	Yes	Postoperative
7. Jones	No	None routinely.	Yes	Preoperative
8. Juul	No	None	Yes, when not fixed.	Preoperative when glands not easily removed. Postoperative often.
9. Laborde	No	None	Yes	Postoperative
10. MacKee	No	X-ray, erythema.	Yes	Preoperative and postoperative.
11. Maisin	No	X-ray or radium.	Yes	Preoperative sometimes. Postoperative always.
12. Paterson	No	None	Yes	None
13. Pfahler	No	X-ray or radium (preferable).	No	Radiation only. Implants in hard glands.
14. Pirie	No	X-ray and radium.	Yes	Preoperative and postoperative.
15. Quick	No	X-ray. Sometimes pack.	In operable cases.	Preoperative. Radiation only in inoperable cases. (Implants and external.)
16. Richards	No	X-ray and radium (both).	If do not disappear with radiation or are larger than beans.	Preoperative and postoperative.
17. Simpson	No	X-ray, full erythema.	No	Depend on radiation.
18. Stebbing	No	External radiation, radium or x-ray, radium preferred.	No	Postoperative
19. Sutton	No	None	Yes	Preoperative and postoperative.
20. Wallace	No	Surface radiation, radium.	Yes	Postoperative, preoperative occasionally.

	Glands Not Palpable			Glands Palpable	
	Dissection	Extent	Other Treatment	Dissection	Other Treatment
21. Bloodgood	Yes	Submental and submaxillary triangle.	None	Yes	Preoperative in late cases.
22. Coller	Yes	Bilateral suprahyoid.	If metastatic glands found.	Yes	Postoperative
23. Handley	Yes	Bilateral suprahyoid.	Implants in unsuitable operative cases.	Yes	Postoperative implants if glands fixed.
24. Hazen	Yes; late cases. No; early cases.	Block dissection.	Following operation.	Yes, if unilateral and hard.	Postoperative
25. Jeanneney	Yes; large ulcerated primary. No; very small primary.	Suprahyoid	None	Yes	Postoperative sometimes.
26. Jorstad	Yes	Bilateral suprahyoid.	None	Yes	Postoperative where complete removal impossible.
27. Mayo Clinic	Yes	Bilateral suprahyoid.	If metastatic glands found.	Yes, frozen section for extent.	Preoperative and postoperative.
28. Morison	Sometimes	Submaxillary region.	Radium sometimes.	Sometimes	Preoperative occasionally; postoperative always.
29. Pichler	Yes	Submental and submaxillary triangle.	Usually not.	Yes	Postoperative
30. Simmons-Greenough	Yes	To bifurcation carotid.	None	Yes	None

CHART 2.—*Cancer of the Tongue*

	Glands Not Palpable		Glands Palpable	
	Dissection	Other Treatment	Dissection	Other Treatment
1. Berven	No	Radium only.	No, only if glands do not disappear with radium.	Radium by choice.
2. Bloodgood	No	In more extensive cases.	Yes	Preoperative at times.
3. Burnam	No	Prophylactic radiation. Sometimes nothing. X-ray or radium.	Yes Block dissection (Not in Grade A)	Preoperative and postoperative.
4. Cade	No	Radium interstitial followed by external.	Yes, if operable and primary healed.	Postoperative
5. Coller	No	X-ray	Yes	Postoperative
6. Eller	No	X-ray	Yes	Preoperative and postoperative.
7. Hazen	No	X-ray, double efficacy. No in cancer of tongue.	No use.	Implants
8. Juul	No	Not when primary surgically treated—x-ray when treated by radiation (Coutard).	Yes When not fixed.	Postoperative often, preoperative when glands not easily removed.
9. MacKee	No	X-ray—erythema.	Yes	Preoperative and postoperative.
10. Laborde	No	None	Yes	Postoperative
11. Maisin	No	X-ray or radium.	Yes	Preoperative sometimes, postoperative always.
12. Pfahler	No	X-ray or radium (preferably)	No	Radiation only. Implants in hard glands if they do not disappear.
13. Pirie	No	X-ray and radium.	Yes	Preoperative and postoperative.
14. Quick	No	X-ray, sometimes pack.	In operable cases.	Preoperative, radiation only in inoperable cases external and implants.
15. Richards	No	X-ray and radium together.	Yes, complete block.	Preoperative and postoperative.
16. Simpson	No	X-ray, full erythema.	No	Depend on radiation.
17. Stebbing	No	External radiation. X-ray or radium.	Yes	Preoperative if extensive. Postoperative.
18. Sutton	No	Radium externally.	Depends on individual circumstances.	Preoperative and postoperative if operation done.
19. Wallace	No	Radium	Yes	Postoperative radiation. Preoperative occasionally.

	Glands Not Palpable			Glands Palpable	
	Dissection	Extent	Other Treatment	Dissection	Other Treatment
20. Grossmann	Yes. In long standing postoperative lesions.	Block dissection.	Radium. X-ray sometimes (with superficial circumscribed lesions of short duration.)	Yes If movable.	Postoperative when glands microscopically involved and if patient's condition good.
21. Handley	Yes	Bilateral block without jugular unless posterior two-thirds of margin of tongue primary.	Implants if general condition contraindicates operation. Ten to twenty two-milligram tubes seven days.	Yes	Postoperative implants if glands fixed. Implants if glands irremovable.
22. Henry	Yes	Block dissection if unilateral lesion with submaxillary area on other side.	Radium	Yes	Postoperative
23. Jeanneney	Yes	Unilateral carotid and submaxillary.	Postoperative x-ray.	Yes	Postoperative always.
24. Jones	Yes	Block dissection. Bilateral if primary in midline.	Occasional prophylactic radiation.	Yes	Preoperative
25. Jorstad	Yes	Bilateral block is ideal.	None except in inoperable cases. Wait when primary has not responded to treatment.	Yes	Postoperative when complete removal is impossible.
26. Mayo Clinic	Yes	Bilateral suprahyoid and deep cervical on involved side.	Prophylactic radiation.	Yes. Frozen section determines extent of operation.	Preoperative and postoperative.
27. Morison	Sometimes	Block dissection.	Radium externally sometimes.	Sometimes	Preoperative occasionally. Postoperative always.
28. Paterson	Yes	Crile block dissection.	None	Yes. If operable.	None. Radiation if inoperable.
29. Pichler	Yes	Bilateral suprahyoid.	Usually not.	Yes	Postoperative
30. Simmons-Greenough	Yes	Radical. Rarely upper triangle only.	None	Yes	None

CHART 3—*Cancer of the Buccal Mucous Membrane*

	Glands Not Palpable		Glands Palpable	
	Dissection	Other Treatment	Dissection	Other Treatment
1. Bloodgood	No	In more extensive cases.	Often	Preoperative and postoperative. Sometimes radiation only.
2. Berven	No	External radium only.	No, only if glands do not disappear with radium.	Radium by choice.
3. Burnam	No	Sometimes prophylactic radiation.	Yes, not in Grade 4.	Preoperative and postoperative.
4. Cade	No	X-ray and radium. Implants occasionally.	Occasionally	Postoperative
5. Coller	No	X-ray.	No	Depend on radiation.
6. Eller	No	X-ray.	Yes	Preoperative and postoperative.
7. Grossman	Usually not	Radium (large lesion longer duration) or x-ray (small lesion short duration).	Yes, if movable.	Postoperative when gland is microscopically involved and when uninvolved and patient cannot be followed.
8. Henry	No	X-ray and radium.	Yes	Postoperative
9. Jones	No	X-ray, prophylactic.	Yes	Preoperative
10. Juul	No	None when primary surgically treated; x-ray (Coutard) when treated by radiation.	Yes, when not fixed.	Preoperative when glands not easily removed; postoperative often.
11. Laborde	No	None.	Yes	Postoperative
12. MacKee	No	X-ray, erythema.	Yes	Preoperative and postoperative.
13. Maisin	No	X-ray or radium.	Yes	Preoperative sometimes. Postoperative always.
14. Pfahler	No	X-ray or radium (preferably).	No	Radiation only. Implants in hard glands if do not disappear with external treatment.
15. Pichler	No	None.	Yes	Postoperative
16. Pirie	No	X-ray and radium.	Yes	Preoperative and postoperative.
17. Quick	No	X-ray, sometimes pack.	In operable cases	Preoperative. Radiation only in inoperable cases (external and implants).
18. Richards	No	X-ray and radium together.	Yes	Preoperative and postoperative.
19. Simpson	No	X-ray, full erythema.	No	Depend on radiation.
20. Stebbing	No	External radiation—radium or x-ray—radium preferred.	Yes	Postoperative. Radiation only if extensive.
21. Sutton	No	None.	Often	Preoperative and postoperative. Sometimes radiation only.
22. Wallace	No	Radium.	Yes	Postoperative radiation. Preoperative occasionally.

	Glands Not Palpable			Glands Palpable	
	Dissection	Extent	Other Treatment	Dissection	Other Treatment
23. Handley	Yes	Complete unilateral block dissection.	Implants if general condition contraindicates operation or patient refuses. As in tongue.	Yes	Postoperative implants if glands fixed. No preoperative.
24. Jeanneney	Most often. Not if primary very small.	Carotid chain and submaxillary.	None	Yes	Postoperative
25. Jorstad	Preferably	Lymph-bearing area draining site.	None	Yes	Postoperative if surgical removal incomplete.
26. Paterson	Yes	Crile block dissection	None	Yes if operable.	None. Radiation if inoperable.
27. Mayo Clinic	Yes	Submental and submaxillary glands.	Prophylactic radiation depends on the growth.	Yes. Frozen section determines extent of operation.	Preoperative and postoperative.
28. Morison	Sometimes	Block dissection sometimes limited to upper cervical.	Radium sometimes.	Sometimes	Preoperative occasionally; postoperative always.
29. Simmons-Greenough	Yes	Depends on situation and type of tumor.	None	Yes	None

is difficult to determine. With nodes impalpable the assumption is that metastasis has not occurred. Why, then, irradiate the area? Because the feeling is present, but difficult of proof, that the resistance of the nodes to metastatic spread is thereby increased. On the other hand, if an impalpable node already contains cancer it is very doubtful that external radiation alone, as given prophylactically, will destroy it; in fact, it is quite improbable. We see primary lesions cured by heavy external radiation that has no effect upon a metastatic gland in the neck. And such heavy radiation is usually not given prophylactically. This is neither condemnation nor appraisal; its real value remains to be determined. That it is of value is suggested, of course, by the large percentage that use it, and one hesitates to lay down any weapon that may aid in the treatment of cancer.

When dissection is routinely performed, less reliance is placed upon irradiation. Of ten correspondents doing dissections in lip cases, nine do not use radiation in any form except some who use postoperative if a metastatic gland is found. In the buccal mucosa cases, five out of seven do not use it, and the other two do so only sometimes. In the tongue cases approximately half combine irradiation with the routine neck dissection.

PALPABLE GLANDS

The fact that one or more lymph glands are palpable is not definite evidence that they are involved by cancer. An impalpable node may contain embolic cancer cells. On the other hand, the infection that is usually associated with ulcerating cancer causes hyperplasia of the nodes, making them palpable. All palpable nodes do not, therefore, contain cancer. Those that do are harder than uninvolved nodes. This distinction between metastatic and inflammatory nodes is exceedingly difficult to make, however, and most men feel that it should not be attempted. Approximately one-third of our correspondents try to distinguish between hard and soft nodes, postponing dissection if these are felt to be inflammatory. This comparatively large figure surprises us, and we are inclined to feel that withholding of surgery is not for long. We do not believe that metastatic nodes can be made to disappear by external irradiation, of one or two erythema doses, whereas inflammatory nodes may.

As mentioned earlier, our committee agreed that dissection should be performed for palpable metastatic glands. This is the consensus of opinion of most men dealing with intra-oral cancer. With the exceptions noted above, this is for all palpable nodes that are operable, and this study applies only to operable nodes. Of course, ideas of operability differ, but we feel that with the increase in knowledge of what can be expected with judiciously applied radiation, both external and interstitial, the limits of operability will be more sharply drawn.

Thus we find that practically all dissect out the glandular area when metastatic nodes are palpable, only two relying entirely upon irradiation in the lip cases. These same two men and one other use irradiation only in those cases where the primary lesion is in the tongue or buccal mucosa. Of those that perform dissection, a small number state that sometimes they irradiate only, to the exclusion of surgical removal. On what their selection of cases is based, we cannot determine from the questionnaire.

The treatment is usually irradiation combined with dissection; one fourth, however, using no supplementary treatment when operable nodes are completely removed in cases of cancer of the lip. Such remarks as "preoperative in late cases" and "postoperative where complete removal impossible" are interpreted as meaning that no irradiation is given when it is felt that nodes can be or are entirely removed; in other words, are operable. Only four men use no irradiation under the same conditions in cancer of the tongue or buccal mucosa. There are different manners of giving this irradiation. A very limited number—three, in fact—confine themselves to preoperative treatment. The rest are about equally divided between postoperative alone and a combination of preoperative and postoperative irradiation.

We have endeavored to evaluate the responses as correctly as possible, realizing that a certain amount of qualification is necessary in the answers. For this reason we have included the tables of responses, leaving each reader to judge for himself the treatment given by each individual.

CONCLUSIONS

Cancer of the Lip.

1. Glands not palpable:

(*a*) In cancer of the lip of sufficient size, duration or microscopic evidence of deep invasion to suggest possible metastasis, two-thirds of the correspondents do not do routine dissection of the lymph glands (twenty versus ten); in other words, two-thirds maintain a conservative attitude.

(*b*) Of the group which maintains a conservative attitude, approximately two-thirds give prophylactic irradiation to the cervical glands (fourteen versus six). This is done either by x-ray or radium packs, or by a combination of both.

(*c*) Practically all of those that do routine dissections of the cervical glands do not give prophylactic irradiation except some that give it if microscopic evidence of glandular involvement is found.

(*d*) The operation most commonly performed where glands are not palpable is a bilateral suprahyoid dissection, this being carried further in some instances if microscopic glandular involvement is found.

2. When glands are palpable:

(*a*) In cancer of the lip when glands are palpable and operable (movable, hard, and not involving both sides to the clavicle), the neck is dissected in by far the greater number of instances, only two depending entirely upon irradiation for the handling of metastatic glands.

(*b*) Irradiation in some form is usually given; only six giving no radiation whatsoever if the glands have been completely removed. Radiation is divided about equally into postoperative alone

TABLE 1.—*Cancer of the Lip*

	Glands Not Palpable				Glands Palpable*		
Dissection	Yes 10		No 20		Yes 25		No 2
Radiation	Yes 1	No 9	Yes 14	No 6	Yes 19	No 6	

* The discrepancy in the figures here is due to the fact that one answered "sometimes." Two stated that dissection is performed if the glands do not disappear following external radiation.

or a combination of preoperative and postoperative radiation. Only four limit themselves to preoperative radiation.

(*c*) Two men responded that they do dissections if the glands do not disappear following irradiations.

(*d*) Slightly more than one-third attempt to distinguish between hard (metastatic) and soft (inflammatory) glands, withholding surgical dissection if the glands are felt to be inflammatory.

TABLE 2.—*Cancer of the Tongue*

	Glands Not Palpable				Glands Palpable*		
Dissection	Yes 11		No 19		Yes 24		No 3
Radiation	Yes 6†	No 5	Yes 18‡	No 1	Yes 20	No 4	

* One stated that dissection is performed if the glands do not disappear with irradiation. Two stated that dissection is sometimes performed. These give irradiation also if operation is done.
† Two of these sometimes.
‡ Three of these only sometimes.

Cancer of the Tongue.

1. When glands are not palpable:

(a) In cancer of the tongue which is early suspected of metastatic involvement, approximately two-thirds do not do a dissection of the cervical glands when none are palpable. (Nineteen versus eleven.)

(*b*) Of those not doing routine dissection, almost all give radiation to the lymph gland bearing area. (Fifteen versus one; three sometimes.)

TABLE 3.—*Cancer of the Buccal Mucosa*

	Glands Not Palpable				Glands Palpable*		
Dissection	Yes 7		No 22		Yes 21		No 3
Radiation	Yes 0	No 7†	Yes 19‡	No 3	Yes 17	No 4	

* One performs dissection if the glands do not disappear following irradiation. Four do a gland dissection at times, and at other times irradiate only to the exclusion of surgery. These all use radiation when surgery is done.
† Two of these sometimes irradiate.
‡ Three of these only sometimes.

(*c*) Of those that do routine dissections, prophylactic radiation is given to the neck by about half. (Six versus five.)

(*d*) The most common operation is a unilateral block dissection to the clavicle; some, however, doing a bilateral block dissection and others a unilateral block dissection, with a suprahyoid dissection on the opposite side.

2. When glands are palpable:

(*a*) In cancer of the tongue, when glands are palpable and operable, by far the greater number do a neck dissection, only three depending entirely upon radiation for the cancer of metastatic cervical glands.

(*b*) Radiation of some type is given in practically all instances where surgery is done for palpable glands, only four giving no irradiation when operable glands are completely removed.

(*c*) Approximately one-half of those giving radiation limit themselves to postoperative irradiation, the other half using a combination of preoperative and postoperative. Only three limit themselves to preoperative irradiation.

(*d*) Two-thirds make no distinction between hard and soft glands.

Cancer of the Buccal Mucous Membrane.

1. When glands are not palpable:

(*a*) In cancer of the buccal mucous membrane of sufficient size and duration to suggest metastasis to the cervical glands, three-fourths of those responding do not dissect the neck when glands are not palpable. (Twenty-two versus seven.)

(*b*) Of those that do not do routine cervical dissections, prophylactic irradiation is given by the large majority. (Nineteen versus three.)

(*c*) When routine dissection is performed, prophylactic irradiation is usually not given.

(*d*) The operation usually performed is a unilateral block dissection; about 30 per cent, however, limiting themselves to the upper cervical glands.

2. When glands are palpable:

(*a*) In cancer of the buccal mucosa, when operable and palpable glands are present, the greater number perform a neck dissection, only three depending entirely upon radiation.

(*b*) When operation is performed for palpable, operable glands, irradiation in some form is given as a part of the treatment in most instances, only four giving none.

(*c*) The type of radiation is equally divided between postoperative alone and a combination of the preoperative and postoperative. Three limit themselves to preoperative entirely.

384 Post Street.

HUMAN AMEBIASIS

A REVIEW OF 700 CASES EXPRESSING 1961 COMPLAINTS

By LUTHER MUSSON BOYERS, M. D.
Berkeley

A GROUP of seven hundred individuals, all later found to have chronic amebiasis, expressed 1961 definite presenting complaints when seeking medical care in California. This number is well

TABLE 1.—*Patient's Own Estimate of Present Status*

1	2		3		4		5		6		7
Category	"Normal" or Apparently No Change		Slight Change, Normality Questionable or Status Variable		Definitely Subnormal or Impaired Status		Summation of Colums 3 and 4		Unclassified or Miscellaneous		Total Number of Expressions
	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	Number	Percentage	
Appetite	219	55.87	116	29.59	38	9.69	154	39.28	19	4.85	392
Digestion	130	41.01	71	22.40	28 (Nausea) 27 (Pain) 61 (Gas)*	8.82 8.52 19.25	187	58.99	....	.....	317
Bowel habit	96	24.06	....	.....	113 (Constipation) 31 (Mucus) 28 (Diarrhea) 25 (Blood) 18 (Blood and mucus) 17 (Diarrhea and constipation) 7 (Gas)*	28.32 7.77 7.02 6.27 4.51 4.26 1.75	239	59.90	64	16.04	399
Sleep	159	42.63	53	14.21	161	43.16	214	57.37	....	.....	373
Central nervous system	43	20.97	....	.....	143	69.76	143	69.76	19 (Headache) and (backache)	9.27	205
Memory	67	31.90	48 (Variable or poor)	22.86	95	45.24	143	68.10	....	.....	210
Morale	108	33.85	....	.....	192	60.19	192	60.19	19	5.96	319
Muscular strength	163	44.41	63 (Variable or poor)	17.17	141	38.42	204	55.59	....	.....	367
Sexual status	121	55.25	38	17.35	55	25.11	93	42.46	5	2.29	219
Frequency of Urination	335	85.68	....	.....	47 (Burning, pain or frequency)	12.02	47	12.02	9	2.30	391
Weight	73 (Gain) 104	22.81 32.50	9	2.81	95 (Loss)	29.69	104	32.50	39	12.19	320

* Refers to a degree of flatulency considered abnormal or distressing by the patient.

distributed among a larger number of other cases of amebiasis less well studied between the years 1919 and 1933.

In making the present analysis of these California patients, wherever possible the patient's own words have been given. In a fair number of instances these quotations are actual diagnoses completely filling the patient's horizon and representing the medical opinion of former consultants, or of physicians themselves seeking advice and care as patients. An attempt has been made in this study to distinguish carefully between the spontaneous, so-called, presenting complaints, and a more detailed enumeration of signs and symptoms elicited by direct questioning, and recorded under the heading of "Patient's Own Estimate of Present Status."

In making these clinical studies my thanks are due to many individuals working with problems involving the human alimentary tract. Express acknowledgment is due C. A. Kofoid, Ph. D., chairman of the department of zoölogy of the University of California; Olive Swezy, Ph. D., and the numerous other members of the staff of this department. Acknowledgment is also due R. T. Legge, M. D., director of the Cowell Memorial Hospital, University of California, for criticism in the preparation of this paper.

COMPLAINTS DIVIDED INTO TEN GROUPS

In the present analysis, it is possible to classify the 1961 complaints from 700 patients into ten groups showing roughly the anatomical system involved and its percentage, as follows:

	Per Cent
1. Complaints referable primarily to the gastro-intestinal tract, representing	39.27
2. Complaints referable to the neuromuscular system, representing	25.49
3. Complaints referable to bones and joints, representing	13.67
4. Complaints referable to the respiratory system, representing	5.30
5. Complaints grouped under miscellany, representing	4.59
6. Complaints referable to the genito-urinary system, representing	3.52
7. Complaints referable to heart and blood vessels, representing	2.60
8. Complaints referable to skin and mucocutaneous areas, representing	2.50
9. Complaints referable to eyes and ears, representing	1.94
10. Complaints referable to glandular system, representing	1.12

DIFFERENT COMPLAINTS MADE BY THE SEVEN HUNDRED PATIENTS

The actual complaints as expressed, without prompting from the examiner, follow:

	Number of Complaints	Percentage of 1961 Complaints
1. REFERABLE TO THE GASTRO-INTESTINAL TRACT:		
"Amebic infection" (41); Amebae found in feces through examination after contact with infected member of family (6)	47	2.40
"Colitis"	9	.46
Constipation ("severe," "obstinate," "lifelong," "hard, bullet-like feces," etc.)	139	7.09
Pain ("soreness," "cramps," etc.)	95	4.84
Bowel-conscious ("sense of weight in abdomen," etc.)	18	.92
Diarrhea or "dysentery" ("mushy stools," etc.)	89	4.54
Flatulence or "gas"	75	3.82
Nausea (38); vomiting (8)	46	2.34
Blood in feces	37	1.89
Mucus in feces	29	1.48
"Indigestion" (29); "Stomach trouble" (24); "Digestive disturbance" (17); "Intestinal upsets" (3); "Logy" or uncomfortable after eating (3)	76	3.88
"Bilious" (9); "Liver trouble" (2); "Sluggish" (2); "Auto-intoxication" (1)	14	.71
"Piles" or hemorrhoids	19	.97
"Grumbling" in stomach and bowel (4)	4	.20
Abdomen bloats (4); Patient "feels puffed up" (2)	6	.31
Pain in region of gall-bladder (5); "Gall-bladder disease" (3)	8	.41
"Bad," "bitter," or "peculiar" taste in mouth, and "inside of mouth is like sandpaper" (10)	10	.51
"Halitosis" or bad breath (5); Tongue coated (5); (Patchy) soreness of tongue (2); Gums occasionally very sore; Flesh and lower gums sore to touch	14	.71
Lack of appetite	9	.46
"Fistula" (1); "Fissure" (1); "Straining at stool" or tenesmus (2); "Erratic bowel habit" (1); Frequent evacuations (1) "Duodenal ulcer" (1); "Diverticulitis"—"Stricture of the bowel above the sigmoid" (1); "Poor control of sphincter" (1); "Pocket in stomach" (1)	10	.51
"Have to be careful about eating" (1); "Much nervousness in stomach and bowel" (1); "Food I eat does me no good" (1); Has been told that HCl of stomach is too low (1)	4	.20
"Summer complaint" (1); "Hyperacidity" (1); "Acidosis" (1); "Fermentation" (1); Has been told that the stomach is placed too low (1); "Thirsty—takes little fluid" (1)	6	.31
Very thirsty—"For days takes nothing but water" (1); Thinks self sensitive to tea (1); "Hungry all the time" (1); Small mass size of apricot in region of gall-bladder—not sensitive (1); Hard mass in grip of anus (1); cramp in upper abdomen (1)	6	.31
Total complaints referable to the gastro-intestinal tract	770	39.27
2. COMPLAINTS REFERABLE TO THE NEUROMUSCULAR SYSTEM:		
Nervous (*e. g.*, "Nerve depletion," "Nervous wreck," "nervous breakdown," etc. (41)		
Irritable (7); Mental worries (1); "Neurasthenia" (2); "Psychoneurosis" (1)	52	2.65
Depression or "lassitude" ("blue," "low," etc.)	25	1.27
Lacks "pep" ("general peplessness," "lack of vitality," etc.)	22	1.12
Lack of motive power ("more will-power than muscle") (2); Below par ("feels run down") (13)	15	.76
"Faintness" (4); "Feels dazed or half-asleep" (1); "Attack in which loses self during a few minutes every few months" (1); "Waves come all over me—I get scared, begin to shake, chilly sensation up and down my spine. Heavy feeling in back of head on rising" (1)	7	.36
"Confused," and difficulty in speaking (2); "Lazy and shiftless—must keep nerved up" (1); Crying spells (2); Epileptic seizures (2); "Exhausted" ("all-gone feeling," "Not any life much," etc.) (14); "Lost nerve" or "scared" ("afraid of self," etc.) (3); Day-dreams (1); "Very apprehensive" (2); Inability to concentrate (2)	29	1.48
Impaired memory ("forgetful," "can't remember what I read," etc.)	12	.61
General numbness (2); Numbness of extremities (3); Numbness of left side of body (1); Numbness of left arm (1); Numbness of right arm (1); Numbness of right arm and hand (1); Numbness of tips of fingers (2); Paresthesias (5); Limbs go to sleep easily (3)	19	.97
Fine and coarse tremor (hands and tongue) (1); Trouble sleeping. Reviews day's happenings (1); Broken sleep (13); Much loss of sleep (9); Insomnia ("wakefulness," etc.) (7); Talks in sleep (1); Bad dreams and nightmares (3); Sleepiness (5)	40	2.04
Headache	76	3.88
Dizziness (27); "Twisting around"—not a dizziness (1); Pressure or peculiar feeling in head (2)	30	1.53
Fatigable ("tired all my life," "weary," "tired most of the time," etc.)	79	4.03
"Life often isn't worth while. Miserable. Can't do what one should do. All in—everything an exertion" (1); "Neither sick nor well—certainly not well" (2); "Everything wrong" (1); "Drags around much of the time" (1); "Sick" (2); "Completely dragged out. No life nor energy" (1)	8	.41
"Whole thing is wrong—feels like a chemical change" (1); "Feels terrible"—"Not sick" (1); "Don't like to work" (1)	3	.15
"Neuritis" (14); "Neuralgia" (7); "Sciatica" (7)	28	1.43
"Aches and pains all over—come and go" (3); "Pain all over" (1); "Sensory disturbance" (1); "Sensations of bees stinging all over body (1); Tingling sensation in lower legs, knees, and lower lumber spine (1); Burning and stinging constantly in hands, feet, and legs (1); Both legs tingle and hurt up through calves and knees (1); "Nerves sore" (1); "Sensation of nerves being laid bare" (1); Muscular soreness or flesh soreness (2); "Cold pain" at insertion of muscles (1)	14	.71
Weak ("flabby," etc.)	38	1.94
"Muscle-twitching"	3	.15
Total complaints referable to the neuromuscular system	500	25.49
3. COMPLAINTS REFERABLE TO BONES AND JOINTS:		
Joint or "bone" pain (aching, etc.)	85	4.34
Arthritis (47); "Rheumatism" (16)	63	3.21
Stiffness (17); Swelling of joint or joints (36)	53	2.70
Joints "creak," "snap," etc. (10); joints are "tired" or "weak" (4)	14	.71
Backache	48	2.45

Back "weak"—fell from ladder on it six years ago (1); "Weak arches" (1); Heels sore on standing (1); Congestion in back of head with stiffness in head, neck and spine (1); Burning pains right heel, both knees, and back (1)	5	.26
Total complaints referable to bones and joints	268	13.67

4. COMPLAINTS REFERABLE TO THE RESPIRATORY SYSTEM:

Antrum disease or sinus trouble (3); Hay fever, asthma, nasal catarrh, or nasal discharge (16); Nasal septum sore during twenty years (1)	20	1.02
Laryngitis or sore throat, chronic tonsillitis or pharyngitis, "throat affection," "dropping" into throat from nasopharynx	13	.66
Pain or difficulty in chest (24); Exposed to tuberculosis in roommate five months (1)	25	1.27
Cough (12); "Many colds," acute cold, "flu" or "grippe" (33)	45	2.30
Blood from mouth (1)	1	.05
Total complaints referable to the respiratory tract	104	5.30

5. MISCELLANEOUS COMPLAINTS:

Seeking Physical Examination—		
Requests physical examination (Mission Board, Health Certificate, School Certificate, etc. (5); Thinks he is normal (1); Feels well (2); Requests typhoid vaccination (1)	9	.46
Accidents—		
Fell down steps (1); Fell ten feet from stack of boxes and hurt left little finger (1); Sprained left acromioclavicular joint (1); Abrasion left leg six days ago on shipboard (1); Recent cut finger (1); Fall from horse about eighteen days ago (1); Eight weeks ago strained right arm (pronators and head of radius) (1); Infected finger (1); Felon on left thumb (1); Biting cheek (1); Lack of extension left arm (1)	11	.56
Unclassified—		
Sudden pain with swelling right groin (1).		
"Pressure" when sitting (1).		
Thin (3); Pale (2); Loss of weight (25).		
Getting overweight (1).		
"Afraid of heart" (1).		
Swelling of feet and legs (2).		
Lues (?) (1).		
Ache in perineum (1).		
Very serum-sensitive (1).		
"Eosinophilia" (1); Severe bleeding after extraction of two teeth two years ago (1).		
Temperature unstable (1); (Low) fever or chills and fever (19); "Anemia" (8)	70	3.57
Total complaints grouped under miscellany	90	4.59

6. COMPLAINTS REFERABLE TO THE GENITO-URINARY TRACT:

"Leukorrhea" (6); "Bloody discharge from vagina when constipated" (1); "Foul-smelling discharge" from the vagina (1)	8	.41
Occasional pain in penis. No discharge (1); Venereal exposure (3); "Morning drop" (2); Sexual powers diminished ("Sexually dead," etc.) (3)	9	.46
Difficulty with menses (4); In menopause (3); Metrorrhagia and menorrhagia (2)	9	.46
Pregnancy	5	.25
	31	1.58
Bed-wetting (1); Hard to tell when to urinate (3); Priapism (1); "Dribbling" on urination (1)	6	.31
Pain in bladder and/or on urinating (7); "Bladder trouble" or frequency of urination (14)	21	1.07
Blood in urine (4); "Specific gravity reported too high" (1); Sugar in urine (1); Albumin and casts in urine (1)	7	.36
"Kidney trouble" or "floating kidney" (3)	3	.15
Urethral tumor (1)	1	.05
Total complaints referable to the genito-urinary tract	69	3.52

7. COMPLAINTS REFERABLE TO HEART AND BLOOD VESSELS:

"Bad heart" or "heart disease" ("valve leakage," etc.) (5)		
Irregular pulse with tachycardia (1)		
"Heart-beat misses" (3); Palpitations (4); Rapid pulse (8); Slow pulse (1)		
Poor circulation (4); Cold hands and feet (2)	28	1.43
Short of breath (on exertion) (7)	7	.36
Blood pressure, both high and low (2); Blood pressure high (9); Blood pressure low (4)	15	.76
Varicose veins	1	.05
Total complaints referable to heart and blood vessels	51	2.60

8. COMPLAINTS REFERABLE TO SKIN AND MUCOCUTANEOUS AREAS:

Eruptions—		
"Red nose" or "acne rosacea" (2); Eruption of face (milia) (1)		
Poison oak (1); "Shingles" or herpes zoster (1); "Hives" (1); Skin irritation about thighs (1)	7	.36
Acne (5); Skin eruption (4); Skin lesion (1); Urticaria with "dopey" feeling, and dizziness and loosening of teeth (1); Eczema (6)	17	.87
Stigmata of skin of hands (1); Psoriasis (1); Petechial hemorrhages (1); Purpuric areas on both shins (1); Red spots on legs (1)	5	.25
Itching of anus or "pruritus ani" (5); Pruritus of anus and vagina (1); "Itchy anus" (1)	7	.36
Furuncle (1); Sores on scalp (1)	2	.10
Perspiration—		
Cold sweats (1); Night sweats (3); Perspires on back (1); Extremities perspire easily (1); "Breaks out in perspiration frequently during the day" (1); Body odors (1)	8	.41
Unclassified—		
Skin dry and peels (1)		
Hair falling (1)		
"Corns" (1)	3	.15
Total complaints referable to skin and mucocutaneous areas	49	2.50

9. COMPLAINTS REFERABLE TO EYES AND EARS:

Eyes—		
"Puffy under eyes" (2); "Dark circles under eyes" (1); Jaundiced sclerae (1)		
Eyes ache or "bother" (are "freaky," etc.) (10); Spots before eyes (2); "Eyes blurred" (1); "Nearsighted" (1); Defective vision (1)		
Swollen left eye (1); Cataracts (1); Styes (1); Inflamed eye (1); Granulated eyelids (1); About a week ago suddenly noticed that the vision in the right eye became very blurred. No pain, but some photophobia (1)	25	1.28
Ears—		
Deafness (5); Buzzing in ear (1); "Stuffy" ear (1); Swelling, back of right ear (1)		
Occasional earache (1); Pain, back of right ear (1)		
Discharge from left external meatus (1); Blood from right ear (1); Otitis media (1)	13	.66
Total complaints referable to eyes and ears	38	1.94

10. COMPLAINTS REFERABLE TO THE GLANDULAR SYSTEM:

Thyroid enlargement or "goiter" (3); Glands (of neck) swollen, or enlarged (5); Hodgkin's Disease (5)	13	.66

Breast complaints (pain, lumps, swelling)	8	.41
Soreness in testes	1	.05
Total complaints referable to the glandular system	22	1.12
Total presenting complaints	1,961	100.00

EXPLANATION OF TABLES

Table 1 gives an analysis of the second clinical category, entitled "Patient's Own Estimate of Present Status," which is set up in contradistinction to the foregoing enumeration of symptoms representing the patient's voluntary statement of complaints. The table is composed of a summary of replies to direct questioning by the physician regarding the patient's habits, as listed in column No. 1 of the table.

The total number of amebiasis case histories in which the "patient's estimate of present status" is recorded on presentation, is 434.

In this group there were nine cases of luetic infection (2.07 per cent); twenty-two other individuals had a history of having had tuberculosis (5.07 per cent).

TABLE 2.—*Patient's Own Estimate of Present Status*

MISCELLANEOUS HABITS

Use of Tea		*Use of Coffee*	
None	68	None	46
Occasionally	57	Occasionally	26
Regularly	26	Regularly	89
Total	151	Total	161
Use of Tobacco		*Use of Alcohol*	
None	82	None	70
Occasionally	12	Occasionally	41
Regularly	49	Total	111
Total	143		

Use of Drugs

None	49
Cathartics	9
Gland preparations	6
For sleep or pain	8
Miscellaneous	18
Total	90

COMMENT

It is the conviction of the author that only by the kind of simplification attempted in this paper can the problem of temperate zone and subtropical chronic amebiasis be impressed upon the general practitioner. There is a minimum of difficulty in diagnosing amebiasis in its acute and obvious form. There is far more difficulty in recognizing it where the complaints seem trivial, and the evidences of disease are obscure.

IN CONCLUSION

In conclusion, it seems to us that these analyses primarily emphasize that in chronic human amebiasis, in the temperate zone, the disease must be studied in its possible effects in tissues far removed from the large bowel. They also indicate plainly that, from symptoms alone, there is inadequate opportunity to evaluate closely the importance of amebiasis in chronic human disease. The wide range of symptoms in this group should stimulate us to prolonged and searching study of the interaction of *Entameba histolytica* with all tissues and organs.

Bank of America Building.

CARCINOMA OF THE BREAST—ITS ROENTGEN TREATMENT*

WITH SPECIAL REFERENCE TO THE INOPERABLE CASE

By J. M. REHFISCH, M. D.

AND

L. H. GARLAND, M. B.

San Francisco

DISCUSSION *by Leo Eloesser, M. D., San Francisco; Orville N. Meland, M. D., Los Angeles; Alson R. Kilgore, M. D., San Francisco.*

STATISTICAL and quantitative reports have been something of a fetish in medical literature for some time, but there still appear to be a few fields of investigation which fail to yield satisfactorily, in ordinary clinical practice, to the statistical method, and carcinoma of the breast is one of these. This is largely due, of course, to the marked variation in the pathological structure of breast tumors, to the widely varying biological reactions of the host, and, last but not least, to the difficulty of complete follow-up in this country.

In a broad sense each case of breast malignancy is an individual problem, with but superficial relationship to any other case. Therefore one cannot group together all types in considering the application or the results of treatment. Malignancy in a pregnant woman under thirty is a very different disease from malignancy in a woman over seventy. How can we make brief statistics out of the response to treatment of these two types of cases?

For purposes of this paper we have abandoned any attempt at statistical evaluation and wish to present merely our clinical impressions as to the results obtainable with radiation, chiefly external high voltage radiation. Our experience in the treatment of these tumors goes back thirteen years. During that time some fundamental principles of technique were evolved and have since been adhered to (in the treatment of about four hundred cases).

GENERAL PRINCIPLES

The technique is based on the following general principles—principles largely biological and not readily susceptible to scientific proof. We believe that cancer stimulates in most people a definite resistance reaction which, in some cases, is almost sufficient to control the growth of the tumor. This resistance is well seen in some types of scirrhus breast cancer, and some types of basal cell skin cancer. We feel that radiation in adequate dosage is an aid to this resistance, but that there exists a very real danger of damaging it by too rapid intensive dosage, especially when this is given postoperatively. It is known, of course, that protracted massive radiation will control inoperable tumors in certain cases (using either external radiation, interstitial radiation or both), but this massive type of radiation can only be used in

* Read before the Radiology Section of the California Medical Association at the sixty-second annual session, Del Monte, April 24-27, 1933.

relatively localized tumors. The problem, in the average case of carcinoma of the breast, is not therefore one of killing all the cancer cells, throughout the wide zone of involvement, but rather of arresting their growth and extension and, perhaps, causing their enclosure in fibrous tissue; the cells are thereby rendered inactive for a variable period.

Cancer of the breast in the majority of cases is not a local disease; the perimammary lymphatics are usually invaded and the axillary, supraclavicular and other lymph nodes often involved. Hence the problem of how wide an area one should include in the field of radiation is an ever present one.

In designing our method of attack, we are strongly influenced by Sampson-Handley's pathological work. As you are well aware, he has shown that lymphatic permeation develops early and is widespread in many cases; hence a wide field must be radiated to include the entire zone of probable permeation. To achieve homogeneous beam intensity over a field so wide, it is necessary to radiate at a long target skin distance. Our usual distance is, therefore, at least 70 centimeters, and our usual radiation field an area 35 centimeters in diameter.

EFFECTS OF RADIATION

The therapeutic result of radiation is believed to be due to both a direct and an indirect effect. There is a direct destructive effect on some of the cells of both the tumor and its stroma. Some cells in both are killed; some are merely damaged. Direct injury to the blood vessels plays the chief indirect part by interfering with the nutrition of those cells already damaged, but not killed. It is well known that cells undergoing mitosis are more susceptible to damage by radiation than resting cells; Ludford,[1] however, finds no specific radiation effect on cancer cells as such. He believes that the primary effects are the same on all cells, but that the capacity for recovery is less and the late changes more marked in tumor cells; it is obvious, however, that such cells are more vulnerable than normal cells.

Many years ago Ewing observed that examination of mammary cancers thoroughly treated with x-rays reveals a series of striking changes, although in the residual fibrous tissue some tumor cells may survive. Lee[3] summarizes the changes as necrosis, with nuclear hyperchromatism, hydropic degeneration of the cellular cytoplasm and granular degeneration of the connective tissue stroma surrounding the carcinoma cells. Ultimately the tumor cells may disappear and a granular detritus remain. Frequently well marked endarteritis is seen in the radiated area, and eventually fully radiated tumors are reduced to dense fibrous cicatricial tissue. One of us has observed all of these changes under the microscope.

INTERVAL BETWEEN RADIATION AND OPERATION

The above pathological changes take some time to develop, the exact duration depending on several factors, such as the rate of delivery of the radiation, the total dose applied, the rate of growth of the tumor and the general resistance of the patient. One of the problems in breast treatment today is the decision (in those cases which have received a course of preoperative radiation) as to how soon operation should be performed. Some believe that operation should be done soon after the radiation is finished, (1) to avoid the stage of hyperemia which occurs after treatment, (2) to avoid the possibility of further growth should the tumor be utterly radioresistant, and (3) to avoid indecision on the part of the patient as regards the need for operation should the tumor recede much. Some believe that operation should be done about six weeks after the radiation is finished, since (1) during that interval such beneficial changes as will occur usually take place, and (2) the tumor may shrink considerably and render amputation in bulky tumor cases much more simple. For figures from several well-known clinics see Table 2.

Some physicians, such as Forssell, repeat the preoperative course in cases that show good recession of tumor or axillary nodes, and again wait six weeks. The preoperative course may even be repeated three or four times before operation is performed. In this connection it is of interest to note a paper by Jüngling[2] in which he, a surgeon, summarizes his observation in fifty-two cases in an attempt to answer the following questions: (1) Can carcinoma of the breast be radiated successfully? (2) Does preoperative radiation render the following operation more difficult? (3) How do the wounds heal in the radiated areas if radical operation is done by the knife or by endothermy? He operated from three to six weeks after a short, six day preoperative course, which consisted of one E. D. (600 r) to the involved side, front and back. He noted no cases where the tumor increased in size following radiation. He believed that in nine per cent of the cases tissue induration made the operation more difficult, but that in the rest no significant difficulty was added. The wounds healed readily (except in a few endothermy cases where the apparatus functioned poorly), and transplantations, when needed, took well, although from the surrounding radiated tissue.

In the majority of the cases in our series, chiefly for technical surgical reasons, operation followed immediately or very soon after the course of preoperative radiation was finished.

RADIATION IN OPERABLE CASES

We believe strongly in the value of preoperative radiation. This is partly on account of our own clinical experience, and partly for the following two well known reasons: (1) It has been shown (Murphy et al.) that cancer tissue grafted under the skin in a region previously given an erythema dose of radiation, fails to take in a high percentage of cases, although a fragment from the same tumor, grafted in a non-radiated area on the same animal, takes in a high number of instances. Preoperative radiation, therefore, diminishes the potential risk from implanting tumor cells in the

wound at biopsy or operation. (2) It has also been shown that preoperative radiation frequently destroys or at least reduces the vitality of outlying cancer tissue in lymphatic vessels or nodes. Forssell and Westermark have shown that doubtfully operable lesions may thereby be made operable.

Preoperative Course.—Our preoperative course is given as follows: one suberythema dose (600 r) anteriorly to the entire hemithorax on the involved side, and one-half that dose posteriorly to the axillary-supraclavicular area; this course is usually given in four days—200 r daily anteriorly for three days, using a 35 centimeter diameter field and a 70 centimeter target skin distance, and 300 r posteriorly on the fourth day, using a 25 centimeter field and a 50 centimeter T. S. D. The other factors are 200 KVP (pulsating, mechanical rectifier), filter 0.5 millimeter Cu. plus 1.0 millimeter Al. (effective wave length 0.16 Å), 30 milliamperes.

The output, at 50 centimeters target chamber distance, is 80 r per minute in air (without backscatter, using a small field).* This dose, being spread over four days, is usually not associated with any serious roentgen sickness. This is important, especially if the patient is to be operated on soon after the radiation is completed. Sodium amytal (gr. 3), given immediately after each treatment helps to allay nausea in sensitive patients.

Postoperative Course.—We believe that postoperative radiation is valuable, though less so than preoperative. Ewing states that postoperative radiation in judicious doses can destroy or render inert outlying foci and operatively implanted cells. It therefore destroys at an early stage, or diminishes the tendency for, local recurrences, and prevents or delays the spread of disease.

Since we believe that we had some very unfortunate results with massive postoperative radiation in our early work (inspired by the enthusiastic reports from the Erlangen massive technique school), we believe that this radiation should be given in moderation and slowly. Hence our postoperative course consists of six doses of 150 to 200 r delivered once weekly for six weeks, to the entire hemithorax, anteriorly (at 70 centimeters T. S. D., with a 35 centimeter diameter field).

We believe that these relatively small doses, spread over a long interval of time, are more likely to aid the biological defense mechanism than more rapidly given intense doses. If everything goes well we repeat the course in three months, again in six months and again in one year.

We have been really surprised by the number of patients who have for long periods escaped recurrence, even with extensive lesions, under this regime. It is superfluous to say that the associated surgical work has been as careful and thorough as is possible. But there were, nevertheless, many women in whom one could hardly hope for cure by operation alone, and yet in whom clinical cures of many years standing were obtained. For statistics from world literature see Table 1.

* Since backscatter to the skin with these factors, at 70 cm. TSD, is approximately 50 per cent, our 600 r air dose equals 900 r measured on the skin. The depth dose at 10 cm. in water with these factors is a little over 50 per cent.

TABLE 1.—*Ca. Mammae—Five-Year Clinical Cures All Groups*

Author and Date	Treatment: Surgery alone	Treatment: Radiation with Surgery
Lee 1928	15%	39%
Forssell 1930	21%	40%
Hintze (collected) 1931	28%	38%
Pfahler 1932	29%	40%
Adair 1932	10%	40%
Authors (collected) 1932 These include Deaver, Greenough figures, etc.	29%	40%

Note.—Lee and Adair separately publish five-year cures in cases treated by radiation alone (external plus interstitial radiation): 36 per cent.

RADIATION IN INOPERABLE CASES

What constitutes an inoperable case? The answer to this question depends on the size and extent of the primary tumor and its associated adenopathy, the presence or absence of fixation, and the age and resistance of the patient. Assuming that by "inoperable" one means "probably incurable by radical surgery," it has been estimated (and statistics seem to prove) that the majority of patients seeking medical advice for breast cancer are inoperable. Hence the inoperable case constitutes a large problem in the care of cancer of the breast.

How should it be treated? Forssell's statistics show that some inoperable cases may be made operable by adequate radiation. We personally know that some cases can be clinically arrested for five years or more by radiation alone. We believe that practically all cases can be very definitely palliated and the lives of many prolonged in comfort by such radiation.†

Can this be done by external high voltage roentgen radiation alone? We believe the answer is, yes in the majority of cases, provided the principles

† Treatment, without biopsy control, may lead to incorrect conclusions in a few individual cases, but in a large enough series of cases such error becomes clinically, though not scientifically, insignificant. Ewing says: "The majority of mammary carcinomata are rather easily recognizable by inspection and palpation, and microscopic examination, especially by frozen section, may usually be dispensed with or reserved for later study. A single, hard nodule in an otherwise unaltered breast is nearly always carcinoma."

TABLE 2.—*Length of Preoperative Roentgen Therapy Course and Interval Between Course and Operation.*

Author and Clinic	Duration of Course	Interval before Operation
Berven, Radiumhemmet	7 days	21 days
Forssell, Sophiahemmet	7 days	42 days
Wintz, Erlangen	7 days	7-14 days
Lynham, London	7 days	10-28 days
Levitt, Bart's Hospital	14 days	42 days
Lee & Pack, Memorial	21 days	42 days

above outlined are adhered to. When we discuss and deprecate the poor results of radiation, we should ask ourselves, Are we not discussing the poor results of poor radiation? that is, incomplete radiation? When we discuss the end results of a certain operation or a certain operative technique we usually first ask "Who did the operation?" before we draw any conclusions. Similarly, before condemning radiation in a certain case as having been useless, we might ask who gave the radiation and how thoroughly?

When patients have extensive fixation of the primary tumor, or supraclavicular metastasis, or very extensive axillary metastasis, or distant involvement, we believe they are inoperable.

In general these cases are treated as follows:

1. *Primary Inoperable Cases, Without Distant Metastases.*—These patients are usually given one suberythema dose (600 r) to the entire involved hemithorax, anteriorly and posteriorly, at 70 or 80 centimeters T. S. D., using a 35 centimeter diameter skin area. This course is given in about one week; it is repeated in six weeks, again in six to eight weeks, and, in favorable cases, again in three months (a total of four courses in approximately seven months).

An alternative method might consist of giving four such doses (2,400 r) in four weeks at one period; the total dose would be 2,400 r anteriorly and 2,400 r posteriorly, but considering the large area treated and the proximity of the liver the patient's tolerance would be fully taxed.

2. *Primary Inoperable Case, With Distant Metastases.*—It is in patients with this type of lesion that the radiologist finds, paradoxically, some of his most gratifying results. To be called to see a woman with a pathological fracture of the hip, in crippling pain, and to be able to relieve her pain in a few days and to produce or aid early union of her fracture is surely a satisfactory type of medical care. To keep such a patient in normal health by occasional courses of radiation for a number of years is certainly worth while. Some of the most dramatic illustrations of the powers of the x-ray to arrest tumor growth and cause regeneration of bone are seen in patients hitherto given up as hopeless on account of crushed vertebrae or other skeletal metastases.

Our general plan is to treat the lesion causing the patient the greatest amount of disability or distress—frequently a spinal metastasis—and then attempt to palliate the primary lesion.

The involved area of bone, being usually deep seated, is treated at a long target skin distance, using a wide skin field. The patient is given 200 r daily, or every second day until 600 r (in air) has been given (front and back), with the factors previously mentioned.

Supportive plaster jackets, frames or splints have to be occasionally used during the stage of postradiation repair.

The primary lesion, especially if distressing on account of odor or discharge, is treated at the same time, or shortly afterwards, by a technique similar to that outlined under (1). We would like to make a special point of the fact that patients with even bulky fungating tumors frequently do better with radiation alone than when treated by mastectomy and then sent for radiation. We also would suggest that patients with clinically suspected, but not radiographically proven bone metastases should always be treated—since most of these patients, if not treated, eventually prove to have such, and valuable time may have been lost.

3. *Recurrent Inoperable Cases.*—These cases vary so much in type and in general resistance that it is impossible to suggest in this brief outline any comprehensive scheme of treatment. Small, definitely local recurrences may do well under the plan outlined under (1). Some cases are, of course, unresponsive, and may even need neurosurgical measures for relief of pain (for example, cases of brachial plexus involvement).

COMMENT

Such is a brief summary of our present practice in the roentgen treatment of mammary cancer. It embodies no novelties, and we can only furnish the much decried "clinical impression" for the faith is in us. Another ten years will very likely cause us to make outstanding changes in our methods, but at present, with the radiological facilities ordinarily available, we feel that as satisfactory results can be obtained by the technique above outlined as by other roentgen technique.*

What are the disadvantages of radiation? We have outlined above the answers to the disadvantages attributed to preoperative radiation. Does radiation in inoperable cases cause damage to the lungs? Our only answer to this is that we have not experienced it in our series. One case of suspected postroentgen fibrosis cleared up very considerably (spontaneously)—we suspect it may have really been a case of atelectasis from hilar gland pressure; this patient has not yet come to autopsy. Does radiation damage the skin? Yes, there is sometimes a late telangiectasis, partial atrophy or induration; two patients whose tumors were clinically "cured" for five years with roentgen treatment alone developed extensive telangiectases over the breast, etc. But they are clinically well, have no pain, have small fibrous masses in their breasts, and are more than content with their lot. No cases of "x-ray burns" (postroentgen ulceration) have been produced. Does radiation make some cases permanently anemic? No; we have seen no such cases.

CONCLUSIONS

Operable cases of cancer of the breast should, in our opinion, receive adequate preoperative roentgen radiation. Operable tumors in elderly

* Should the ovaries be radiated in cancer of the breast in women before the menopause? While certain investigations appear to point to the advisability of this procedure, we do not do so routinely. The average castration dose would be 500 r (air) to the pelvis, front and back, delivered in a few days. Should the pituitary gland be radiated in such patients? We do not believe that the clinical and experimental work published so far justifies the routine treatment of the pituitary as an aid to inhibition of tumor growth.

women may well be treated solely by radiation, but the advisability of relying on this treatment alone is still questionable. Judicious postoperative radiation seems advisable as a routine procedure.

Doubtfully operable cases should probably be given the benefit of the doubt, and be operated upon after a thorough preoperative course. Postoperative radiation is of unquestionable value in these cases, and should be given, we believe, routinely.

Inoperable cases should be handled by radiation alone, either by carefully planned external high voltage radiation, or by a combination of such radiation, with well filtered and carefully distributed interstitial radium radiation.

450 Sutter Street.

REFERENCES

1. Ludford, J.: Tenth Report Imperial Cancer Research Fund, p. 203, 1932. (Reviewed in editorial, Brit. Jour. Rad., 5:801, 1932.

2. Jüngling, O.: Healing of Wounds in Tissue Radiated Preceding Operation, with Special Consideration of Breast Cancer, Strahlentherapie, 44:125-130, 1932.

3. Lee, B. J., Pack, G. T., Quimby, E. H., and Stewart, F. W.: Irradiation of Mammary Cancer, with Special Reference to Measured Tissue Dosage, Arch. Surg., 24:339-410, 1932.

4. Forssell, Gosta: Radiotherapy of Malignant Tumors in Sweden, Brit. J. Rad., 3:198, 1930.

5. Evans, W. A., and Leucutia, T.: Deep Roentgen-Ray Treatment of Mammary Cancer, Am. J. Roentg. and Rad. Ther., 24:673, 1930.

DISCUSSION

Leo Eloesser, M. D. (490 Post Street, San Francisco).—The thesis set forth by Doctors Rehfisch and Garland that roentgen treatment is of value in both operable and inoperable mammary cancer is so well established that it no longer needs discussion. Matters of detail, however, are still open to question; and as the authors avowedly record clinical impressions rather than statistical facts, perhaps I may be allowed to add my ideas to theirs. I am much indebted to them for their constant ready coöperation, for almost all of the mammary cancers that have come to me for treatment, both operable and inoperable, have had the benefit of their help. They have treated a number of patients with distant bony metastases, among them a woman who sustained a spontaneous fracture of a cancerous humerus; whose fracture healed as well as it would have in a normal bone, and who lived for some three years, attending to her daily affairs in comfort, until she died suddenly of a heart attack, which may have had no relation to her cancer. Of the value of x-ray for such patients there can be no doubt.

The question of what to do for patients who are to be operated upon is of greater interest. You will note I say "to be operated upon" and not "operable," for only time and the ultimate results can decide whether patients are really operable or not when they come to operation. The x-ray seems to have a definite effect in preventing both metastases and local recurrence. Local recurrence is less to be feared, for modern technique has reduced local recurrence greatly. Preoperative radiation, however, has given me such confidence that I think that very extensive removal of skin is no longer necessary. A three-limbed incision, radiating about the tumor as a center and excising a reasonable amount of skin, and as much as seemed suspicious of infiltration, has sufficed and made large defects to be covered with grafts unnecessary. Metastases to the axillary lymph nodes have also been greatly reduced, as well as recurrences of lymph nodules in cases in which cancerous axillary glands were removed at operation.

Patients with suspicious mammary growths, as well as those with definite cancers, have been sent for a series of preoperative radiation distributed over four or five days, as described by Doctors Rehfisch and Garland. During this period the patients were ambulatory; from one to five days after finishing the course, they were hospitalized and operated upon. The skin was incised with a knife, but after the skin was severed the rest of the operation was done with a Percy cautery, which seems safer and more effective than the radio knife. The results have been so astonishingly good that it would require much persuasion to make me deviate from this plan.

Early operation has seemed much preferable; one removes the great mass of cancer; the changes induced by the x-ray in the surrounding and distant tissues go on for several weeks after operation and tend, it seems, to render inactive the few remaining cancer cells which the tissues contain; the operation needs be less radical and less destructive. Fibrous shrinkage is not yet troublesome at operation, but goes on for several weeks afterward, so that one is still operating in soft tissues that may be easily and gently handled. It seems that, in theory at least, this plan is greatly to be preferred to one which delays operation until full fibrosis has become established, then reopens the indurated and scarry tissues which are still full of cancer, and closes them with no further help from the previously administered radiation, which in the three to six weeks of waiting for the delayed operation has spent its force.

I have done but one delayed operation on a breast cancer, and in that one I was so fearful of incising the scarry tissue that I had a course of x-ray repeated just before operation. Delayed operations done in the neck have been difficult: bleeding has been hard to control, the tissues difficult to handle, and recurrence has been prompt.

My knowledge of a combination of post- and preoperative radiation is meager. Preoperative treatment is the essential one. In cases in which mediastinal involvement seems likely, in young and plethoric women, postoperative treatment would seem indicated. However, whether pre- or postoperative, I fully agree with the authors that the dosage should not be so massive as to make the patient sick. If the women are badly nauseated, if they lose much weight and become anemic, they are likely to be more hurt than helped by the x-ray.

Patients with pleural effusions and patients with liver metastases have not been benefited by radiation. In others, radiation, as described above, has made of breast cancer a hopeful instead of a desperate disease.

✻

Orville N. Meland, M. D. (1407 South Hope Street, Los Angeles).—This paper of Doctors Rehfisch and Garland is representative of the radiological viewpoint in the treatment of carcinoma of the breast. Therapeutic radiologists may differ in their technique and time spacing, but all are agreed that unless the patient is given irradiation in conjunction with her surgery, she is not receiving the benefit of all the approved weapons in stamping out the disease. Even surgeons who are not in favor of the use of preoperative treatment, or prophylactic postoperative treatment, agree as to the palliative benefits in local recurrences, and the painful metastatic lesions, as found in bone.

Every radiologist sees a number of patients with carcinoma of the breast who are in good condition, but have either an extensive local involvement or fixed involvement of the axillary nodes and, at times, supraclavicular involvement. These patients are plainly inoperable from the standpoint of complete eradication, for experience has shown that the disease may progress much more rapidly after incomplete removal than before. In patients falling into this group, we have been using interstitial radiation by means of platinum needles, the thickness of which is five-tenths millimeter. The amount of radium in each needle varies from one to two milligrams. The Keynes tech-

nique of insertion is used; namely, a complete barrage around the primary tumor, as well as needling in the axillary, supraclavicular, infraclavicular, and mediastinal fields. A little thought shows that in this method the effects of radiation are carried far beyond the field of the most radical breast surgery, as usually done. We have been doing this work over three years, and, although it is too early to say that it should be used in operable cases, it is a very superior method of treatment in the inoperable group. After the immediate radiation effects wear off, the breast slowly assumes a normal appearance and the nodes completely disappear. In some patients the primary tumor may shrink down to a small hard lump, composed of a mass of fibrous tissue in which remnants of carcinoma at times remain. This small tumor may then, if the patient demands, be removed by electrosurgery, with good palliative results.

✻

ALSON R. KILGORE, M. D. (490 Post Street, San Francisco).—That the treatment of carcinoma of the breast is a field of study to which the statistical method is inapplicable, is a statement which will be read with some surprise. Doctors Rehfisch and Garland have stated quite properly that breast cancer in a pregnant woman under thirty, and in a woman over seventy, are two different diseases, and that even in women of comparable age, breast cancers present remarkable variations in pathologic structure and in clinical course. It is this very fact of extremely variable course which makes it unsafe to draw conclusions regarding efficiency of treatment from clinical impressions about one case or a few cases. If Doctors Rehfisch and Garland intend to deprecate the cluttering of medical literature with statistical tables based upon series of twenty-five, fifty, or one hundred unclassified cases, I am in hearty agreement.

But four hundred cases of breast cancer is a substantial group, and conclusions from such a series should be significant, whether called "clinical impressions" or statistics.

With the conclusions that roentgen therapy offers relief and prolongation of life in inoperable cases, and especially preoperation therapy adds to the chances of successful surgical attack, no student of breast cancer will disagree. It is gratifying to see an intelligently planned, thorough technique adopted and adhered to.

Doctors Rehfisch and Garland have pointed out one of the important questions still unanswered. Is efficiency of preoperation therapy dependent upon the time within which the treatment is given, or upon the interval between treatment and operation? Should operation be done immediately following radiation, after three to six weeks, or even after maximum regression of tumor mass has been obtained by repeated courses of treatment?

I do not see how these questions can be answered except by adequate "five-year cure" statistics, carefully controlled. From the number of cases required in each of various treatment method groups, it appears that we shall still wait a long time for our answers.

✻

DOCTOR GARLAND (Closing). — The problem of how long an interval to allow between the end of the preoperative course of roentgen therapy and the day of operation is, as Doctor Kilgore states, still a most unsettled one. The bulk of surgical and pathological experience would seem to indicate that with preoperative therapy, such as we have employed, marked fibrosis is not likely to develop so soon as four or six weeks after finishing the radiation. If it did, we would certainly hesitate to advise operation at that time.

We have seen marked fibrosis develop in a few cases, but each of these patients received three or four courses of roentgen therapy and the fibrosis did not develop for several months. As Doctor Eloesser indicates, his predilection for the short interval between the roentgen course and operation is based to some extent on the conditions found in one case, wherein a long interval developed unintentionally. While the fibrosis in this case may have been entirely due to the radiation, it is not impossible that it was due partly to other factors as well (such as the type of tumor, and the presence of several preceding attacks of mastitis). Therefore, with all due respect to Doctor Eloesser's mature judgment, I personally feel that this experience would require confirmation by other similar cases before one could thereby support a contention that a delay of four weeks is dangerous.

In regard to Doctor Meland's work with radium needles, it requires a very large amount of radium in very special needles plus considerable experience in the insertion and distribution of those needles. Therefore, it is not yet a technique which can be used outside of a few fortunate and well-equipped centers. As previously noted, our aim in this paper was to present a technique which could be used in many parts of the country.

THE LURE OF MEDICAL HISTORY*

FIFTY YEARS OF PROGRESS IN THE PREVENTION OF DISEASE†

By J. C. GEIGER, M. D.
San Francisco

II‡

QUARANTINE

QUARANTINE, derived from the Italian word "quaranta," meaning forty, is a term of the old sanitary system applicable today in administrative control of a number of diseases. The value of quarantine depends upon many factors, some of which were not taken into consideration or were quite misunderstood when it came first into use. Even today it is subjected to interpretations more or less conjectural; for instance, the two-week quarantine of contacts of cases of infantile paralysis. Quarantine regulations, fully enforced, generally mean loss of time to individuals, loss of commerce to nations, and a decided disturbance of the relations between doctor and patient, health officer and politician, health officer and some active religious cult. Originally, quarantine meant the detention of ships and men, had certain relations to the loading and unloading of cargoes; and later it was aggravated by introducing fumigation. Plague was thought to have been imported into London by bales of merchandise from Holland, which came previously from the Levant. The disease disappeared from London about 1703, perhaps helped by the great fire of 1666; but the disappearance was attributed to the quarantine regulations. The modern epidemiologist, however, while he recognizes that modification, gradation, and even cessation of many epidemic diseases may occur, knows that others

* A Twenty-five Years Ago column, made up of excerpts from the official journal of the California Medical Association of twenty-five years ago, is printed in each issue of CALIFORNIA AND WESTERN MEDICINE. The column is one of the regular features of the Miscellany Department of CALIFORNIA AND WESTERN MEDICINE, and its page number will be found on the front cover index.

† One of a series of public lectures by invited speakers, conducted by the Stanford University School of Medicine.

† From the Department of Public Health, San Francisco.

‡ This paper is appearing in serial form. For Part I, see November CALIFORNIA AND WESTERN MEDICINE, page 327.

will continue unless systematically destroyed; he knows, for instance, that the continuity of the plague depends upon the survival of the infected rat or other rodent with its resident fleas.

The limitation of freedom of movement of persons or animals who have been exposed to disease is generally a period equal to the known or suspected incubation period. Susceptibility or immunization play their part, so that flat or fixed rules are difficult to make and difficult to enforce. For instance, measles quarantine has been placed on a patient for the duration of the appearance of the rash, and yet probably long afterward the patient is capable of transmitting the disease. On the other hand, recent successful vaccination against smallpox would eliminate further detention of contacts. Presumably, therefore, simple quarantine regulations may mean very little in the control of disease unless proper surveillance or isolation is practiced. The problem may become as manifold as are the regulations for different countries, states, counties, or cities. The value of the epidemiological section of the League of Nations and that of the United States Public Health Service in standardizing regulations for quarantine or for disseminating information of the presence, spread, or trends of disease, cannot be overestimated.

Quarantine regulations may be spoken of as local (city, county, or state), interstate, or maritime. Generally, local regulations must coincide with those of the state, although it has been conceded that these may be made more comprehensive but never less so. Interstate quarantine regulations are considered a function of the United States Public Health Service, and rarely now do controversies arise between states as to the control of disease within the borders of their neighbors. On the other hand, health officials exchange information and study the public health reports prepared by the federal authorities. The sorry spectacle of olden days, the quarantining, for instance, of Louisiana by Texas for yellow fever, has been eliminated.

The terms "isolation" and "quarantine" are frequently used by many health officials interchangeably. Technically speaking, quarantine means detention of the well for varying incubation periods; isolation means control of either patients or carriers.

The defense of countries, nations, or continents against disease is known as maritime quarantine. Plague-infected rats are by it reduced to a safe minimum in ports of commerce; the breeding grounds of yellow fever and malaria mosquitos are destroyed; safe water protects against typhoid and cholera; food supplies may be inspected, and medical and laboratory examinations of food handlers instituted to prevent amebic dysentery; clean environmental conditions against lice may eliminate typhus fever; and vaccination of the populace may prevent smallpox. If all of these measures could be carried out or supervised by an active, scientifically trained health department, maritime quarantine would be entirely unnecessary. Maritime quarantine is enforced by the United States against cholera, yellow fever, plague, typhus fever, smallpox, leprosy, and, more recently, epidemic cerebrospinal fever. The time of the detention is in accord with the known or accepted incubation period, and counted from the last exposure. Well-equipped quarantine stations are maintained at strategic ports. Communication of any kind with ships in process of quarantine in ports is forbidden until such ships are released by the responsible officer; the vessel itself may be disinfected; the crew and passengers detained until suitable laboratory examinations, when necessary, can be completed, and the actual source of the disease traced, particularly if contracted in a port or on shipboard. All vessels, domestic or foreign, touching United States ports from abroad are required to secure from consuls what is known as a "bill of health," submit a statement of health conditions aboard ship, and the number of passengers discharged and embarked at various ports. The boarding quarantine officer will examine the crew and passengers and, if there is no communicable disease aboard, the vessel is discharged with a so-called "pratique." In addition, whether ships are rat-proofed or not, if they come from plague-infected ports, fumigation is mandatory. This has, in the past, caused delay and seemingly unnecessary expense to shipping. It is fully recognized that quarantine measures do not supply absolute protection; the faster the transportation and the more likely the carrier state, the more doubtful the control. What is desirable is the enforcement of measures that do not overinterfere with commerce, but which convey a maximum of protection with a minimum of annoyance and expense. But even under the best conditions, maritime quarantine not infrequently partially fails.

The quarantine of local infestation can be pointed out only in a general way, for space forbids detailed discussion. Contagion lines may be determined and control measures used against them; but the healthy carrier offers additional problems, especially in typhoid, diphtheria, and the epidemic diseases of the central nervous system. Theoretically, isolation offers an ideal method for control, but many cases are either not reported or not recognized. Therefore, the practicability of isolation varies and usually is in inverse proportion to the reporting, the promptness of reporting, the number of carriers, the time of communicability, the susceptibility, the dosage and the virulence of the microbic or viric factor. Regulations markedly vary with the disease. Yellow fever or malaria may be isolated behind suitable screens; primary or unvaccinated contacts of smallpox controlled or isolated for the entire incubation period; typhoid bacilli carriers removed from dangerous occupation, such as cooks, and syphilitics with open lesions properly isolated, treated, and educated. On the other hand, the tuberculous or the leper who is careful can be allowed more or less freedom.

To quarantine or isolate properly and early is to neutralize the spread of disease. Communica-

ble disease hospitals, especially for diphtheria, smallpox, and scarlet fever, have become effective. Many perplexing problems arise as to the wage-earner, and the school child, and as to regulations for each disease. Diphtheria, for instance, can be released on two negative nose and throat cultures taken at suitable periods. Notwithstanding its many limitations, quarantine procedure is the measure most used by the health official, and, as our knowledge of disease progresses, will become necessarily more effective.

EPIDEMIC INFLUENZA

In respiratory infections beyond seasonal expectancies or during great pandemics, "influenza" as a term becomes important from a clinical, pathological, and bacteriological standpoint, and infinitely significant from a public health standpoint. The disease occurs in serious and furious epidemics, and in great pandemics, as an acute, highly communicable, febrile disease. It has a high mortality rate. In the 1918 outbreak it is estimated that over two hundred million cases and ten million deaths occurred in a period of twelve months throughout the world. In the United States alone there occurred twenty million cases and 450,000 deaths.

Since the year 1175, there have been eighty influenza pandemics; Willis and Sydenham described the great outbreak of 1510. Such pandemics create public health situations that even today rapidly become chaotic as to control measures and investigative procedures. Rapidity of spread and rapidity of subsidence, and the undoubted occurrence of interepidemic types, make the investigative problem a complicated, necessarily hurried and expensive one. The relationship between pandemic and interepidemic influenza is obscure. The obscurity extends to the relationship of type causative strains of bacteria or viruses at both periods. There is no unanimity of opinion upon the origin of the virus, or the possible modification or attenuation.

Since 1918 the public health official has been concerned only with interepidemic influenza. Apparently this type of the disease may be considered a respiratory infection, diffusing through and involving whole communities, or occurring in sharply defined outbreaks in schools, colleges, and other institutions. Clinical identification of influenza is obviously difficult but not unattainable. Conversely, microbic or viric identification is at present impossible. It is, therefore, on certain epidemiologic characteristics that identification can be based with any degree of certainty. The epidemiologic features *en masse* may be briefly stated to be the close relation of the curve of influenza to that of pneumonia; its high morbidity, its rapid dissemination over wide areas, its generally characteristic racial and age incidence, and its dislocation of ordinary age distribution mortality of respiratory diseases with increase in young adults; its great explosiveness (the peak of the curve being reached in two or three weeks, or an incidence curve of not more than four to eight weeks), its high dispersiveness (many widely scattered cities reaching the peak of the curve about the same time, for no disease spreads so rapidly in so short a time); and its recurrences.

But the lack of progress in control measures, of knowledge as to methods of spread, and of information as to a microbic or viric factor need not deter discussion. In 1918, when influenza swept the world in a vast pandemic, 230,845 cases were reported in California. The years 1920, 1922, and 1928 could be considered interepidemic years for California, for there were reported approximately an equal number for each year, with a total of 160,000 cases for these periods. Compare this with such non-epidemic years as 1921, 1924, and 1930, when approximately 1,800 cases were reported on an average and over 5,400 cases for these periods. Naturally, predictions of the future of influenza in California, or the world, are fraught with statistical difficulties; but the health official should carefully watch the records in order to give warning of any trend to epidemic proportions.

Definite conclusions appear to be unwarranted. A wave of respiratory diseases, many cases of which have been diagnosed as influenza, has recently swept over parts of the eastern section of the United States. New York City reported sixty-eight cases for the week ending January 3, 1931, and 1,140 for the week ending January 24. New Jersey, Maryland, North Carolina, and South Carolina reported similar increases. California reported only 159 cases for the first two weeks in January. During the week ending January 31, 1931, approximately 13,000 cases of influenza were reported, two-thirds of which were in the South Atlantic States, and 60 per cent in Maryland, North Carolina and South Carolina. In Europe, Poland reported increased prevalence in November, 1930; Germany and France in December, 1930; Jugo-Slavia, Denmark, Switzerland, and Spain in December. The disease was evidently mild, and clinical benignity the rule. England and Wales reported from 107 towns in December that the general mortality was 12.8 per 1,000, which increased to 17.2 per 1,000 in the week ending January 17, 1931.

Having so lightly disposed of 1930 and 1931, let us consider 1928 and 1929. Any doubt as to the reality of an epidemic of influenza can be dispelled by a survey of the mortality statistics. Up to January 5, 1929, twenty-six thousand deaths occurred in the United States which were attributed to this epidemic, and this is a conservative estimate. Mortality was definitely on the decline in January, 1929, especially in the Pacific and Mountain States. This epidemic, as well as that of 1926, apparently started on the Pacific Coast.

The origin of epidemics of influenza is shrouded in obscurity, if, indeed, a single starting point exists. One need only recall the history of the 1918 outbreak to bring to mind that there was reported present in the army camps of Great Britain and Continental Europe in 1916-1917 a purulent type of bronchitis with the so-called

heliotrophic hue or cyanosis. The disease was then not regarded as contagious, but it was perhaps the precursor of the great pandemic of our time. In fact, in the spring and summer of 1918 western Europe had a disease which was probably the immediate forerunner of the pandemic, and is now called the first epidemic wave. The observations at the autopsy of LeCount in Chicago in April, 1918, and the explosive type of outbreak at Camp Funston and Camp Oglethorpe in March, and particularly the reports of Kerr and his associates at Camp Lewis in April (see Kerr's report), indicated the probable presence of epidemic influenza in both the United States and Europe in early spring, at least in April.

It appears, therefore, that in wide areas of the world, in 1918, outbreaks were occurring, yet original foci or transference from one country to another, or one continent to another, cannot be traced with any degree of plausibility. Two epidemiologic facts stand out prominently: that the first wave was relatively trivial; and that the second wave was more explosive, more dangerous, more dispersive, more incapacitative, and more depressive of mind, reaching the crest of the wave in October and November. Epidemics which show all such features, especially the world-wide prevalence, are somewhat rare. Minor epidemics or recurrences at frequent intervals have practically the same epidemiologic characteristics, but present less severe clinical types and, therefore, less effect on the general mortality. It would appear that since 1918 distinct outbreaks have occurred, particularly in 1920, 1923, 1926, and 1929, with certain other minor affairs, that are true epidemic influenza of modified virulence and intensity. The increased mortality from respiratory disease for these periods, in triplet waves, with statistical mortality superiority for 1920 and 1929, may be sufficient ground for assuming that a maximum respiratory death rate may appear in 1932.

The tendency of epidemic diseases is to fluctuate, usually maintaining a fixed seasonal basis. Epidemic influenza, however, has spread at irregular intervals over wide areas, affecting large proportions of the population and presumably disregarding climatic and seasonal conditions. The accumulation of population susceptibles is a doubtful factor since, ordinarily, individual immunity is considerably transient.

Of all epidemic diseases, influenza is unique for its rapidity of incidence; extraordinary extent over land and sea; its occurrence in opposite seasons, no matter what the weather; its effect on all classes of people; its varying clinical intensity; its apparent extension to animals, for instance, swine; and its recurrence at irregular intervals. There should be unremitting collection and collation of data, especially clinical, of every visitation of the disease, in order to deduce the mode of propagation, the exciting factor, and the measures to be adopted for control. To scientific medicine and public health, this disease offers a most intriguing mystery to be solved.

(To be continued)

CLINICAL NOTES AND CASE REPORTS

SPLENIC EXTRACT—ITS EFFECT ON THE CALCIUM OF BLOOD SERUM *

By JOHN FERGUSON, A. M.
Edmonton, Canada

A PROTEIN-FREE extract was prepared from the spleen of young cattle, care being taken to remove the gland from the carcass as soon as possible. This powder was dissolved in 0.9 per cent NaCl solution and injected subcutaneously. Calcium determinations of the blood serum were made before the injection, and twenty-four hours after it (Clark and Collip method).

In each case a drop in calcium was noted:

1. Dog: 11.5 to 10.5 milligrams per 100 cubic centimeters of serum.

2. Rabbit: 14.1 to 12.8 milligrams per 100 cubic centimeters of serum.

A control (rabbit) showed no significant change, being 13.2 milligrams before the injection, and 13 milligrams twenty-four hours later.

Edmonton, Canada.

SANTONIN POISONING

By W. A. VINKS, M. D.
AND
A. W. McARTHUR, M. D.
Lincoln

PRACTICALLY all standard texts on pharmacology emphasize that a drug as potent and dangerous as is santonin should be sold only on prescription; and yet a few inquiries at retail pharmacies show, without a doubt, that far more of the drug is sold to mothers who have received their advice from the next-door neighbor, and whose only guide to dosage is the legend on the box. And the manufacturer's directions are not only loose and inadequate, but sometimes definitely improper and dangerous. In this case, here is a drug which, according to Sollmann, Solis-Cohen and others, should not be given on an empty stomach, as this favors absorption, which is most undesirable; and yet the directions on a popular brand of "worm candy" (whose chief constituent is santonin) state: "To obtain best results from the use of this preparation, fast for twelve hours before commencing its use and while taking it. In the case of children, where fasting is difficult, only milk or some other light diet should be given." Furthermore, a given dose of the drug cannot be taken with safety by all children of the same age, as the regular U. S. P. dose has produced serious poisoning in a weak and emaciated child and two such doses have been fatal. In other cases, three and four times the dose has produced only minor symptoms.

* A preliminary communication.

* From the department of physiology and pharmacology, University of Alberta, Edmonton, Canada.

Without any reference to the therapeutic indications of santonin, the writers cite the following case to show the dangers of its improper use, even when much less than the customary dose is used.

REPORT OF CASES

CASE 1. — A somewhat undernourished girl, seven years of age and weighing forty-five pounds, who has usually been in fair health except for a moderately severe attack of influenza five years before, and mild chronic tonsillitis at the time, was discovered to have pin-worms (*Oxyuris vermicularis*) and was given a preparation of santonin and podophyllin, called "worm candy" and sold to the general public by a well-known chain drug-store company. The mother thought this a safe medicine to use because, previously, she had given it to another child, on a physician's advice, and there had been no untoward results. On May 6, at bedtime, two "candies" (later ascertained to contain one-fourth grain santonin each) were taken by this girl on an empty stomach, and the next morning two more. (Total amount of santonin ingested was one grain, the printed directions having allowed 2¼ grains for one of her age.) No food was taken all this day, and a laxative at night produced a fair bowel movement. On the afternoon of May 7 the urine became dark-colored, and the child complained of seeing yellow. That night she became severely ill, had colicky pains in the abdomen, nausea and trembling, and the next day she vomited several times and was too weak to sit up. On examination, the following findings were noted: The patient was in a peculiar semistupor and complained somewhat of pains in the abdomen. There was a marked generalized jaundice, sweating, and a coldness of the skin. The pulse was slow, regular and soft, and the breathing slow. The blood pressure was 90/55. The throat was negative, except for chronic tonsillitis; the pupils reacted normally, heart tones were slow, regular and distant, and the lungs negative. The abdomen was tender to touch, particularly on the right side, the right rectus muscle being much more spastic than the left; the liver was enlarged to one inch below the costal margin in front, and the spleen and kidneys were not palpable. Urinalysis revealed: dark orange color, moderate turbidity, slight trace of albumin, no sugar, numerous blood cells, no casts, no pus cells, large amount of amorphous material, some uric acid crystals, reaction acid, Gmelin's test for bile negative, Huppert's test for bilirubin negative, while Schlesinger's test for urobilin showed a very slight fluorescence, and Hay's test for bile acids negative. The Van den Bergh test, made by Dr. Paul Christman of Sacramento, showed a biphasic reaction, and the indirect quantitative test revealed 0.8 milligram bilirubin per 100 cubic centimeters of blood. On supportive and eliminative treatment the patient recovered, most of the symptoms leaving in about four days, and the jaundice in seven; but tenderness to pressure over the liver and slight spasticity of the right rectus remained for about two weeks.

* * *

CASE 2.—A slightly underweight boy, nine years of age, who had been fairly healthy except for tonsillitis occasionally and chicken-pox and whooping-cough some years before, was given the same preparation of santonin as in the above case. The mother thought that she had seen pin-worms around the child's anus and administered the treatment without consulting a physician. The child took two "candies" on the morning of May 8, had no food all day, took two more that night, and then two more the next morning, with no food till the afternoon of the second day. (Total amount of santonin ingested was 1½ grains; printed directions allowed 2½ grains for one of his age.) No cathartic nor enema was administered, but the bowels moved naturally on the night of May 8. That same night the child became ill, and next morning the mother noticed that his sclerae were yellow and that the urine was dark orange. Soon the entire skin became jaundiced and there was giddiness, trembling, cold sweat, vomiting, followed by stupor. Physical examination revealed a very sick child—toxic, in a stupor, and markedly jaundiced. The skin was cold and damp, there was a side-to-side rolling of the eyeballs, and a twitching of the hands and arms. The pulse was slow and soft, and the heart-tones feeble. Later the liver and spleen were both determined to be enlarged, but the kidneys were not palpable. Urinalysis: Dark brown color, moderate turbidity, no sugar, large number of blood cells, no casts, no pus cells, large number of crystals, large amount of amorphous material, tests for bile negative. The indirect Van den Bergh by Doctor Christman of Sacramento showed presence of 1.5 milligrams of bilirubin per 100 cubic centimeters of blood. Under supportive and eliminative treatment, the patient recovered. Most of the symptoms were gone within five days, and the jaundice left in seven days; but the soreness and enlargement of the liver remained three weeks. A urinalysis at the end of ten days showed presence of a few red blood cells, but no other significant findings.

COMMENT

1. Overdoses, and sometimes conservative doses, of santonin may produce serious poisoning, and should therefore be sold only on prescription.

2. Physical condition of the child, as well as age, should be taken into consideration in determining the dosage.

3. The drug should not be given on an empty stomach, as this would favor absorption. A rapidly acting cathartic should not be forgotten, as it would shorten the absorption time.

Fourth Street at D.

FETAL PERITONITIS*

By ALFRED J. SCOTT, JR., M. D.
Los Angeles

IN a recent journal, Abt[1] discusses the causes for fetal peritonitis and reports illustrative cases. He reviews briefly the history of this subject from the time of Simpson in 1838.

ETIOLOGY

The etiologic factors causing fetal peritonitis may be: (1) Inflammatory processes, either bacterial or nonbacterial, possibly transmitted from the mother through the placenta. (2) Syphilis (?). (3) The escape of intestinal contents into the peritoneal cavity. Prior to the fifth month of gestation, the intestinal contents are sterile; but after the fifth month, probably infectious. Aseptic meconium results in a noninfectious peritonitis. The site of the lesion is usually at the lower part of the ileum, cecum or the sigmoid, and the size of the lesion may be from a pin-point to a large rent. (4) Urinary tract malformations may result in peritonitis. (5) Fetal appendicitis may be present. (6) Adhesions and bands may be due to developmental or embryonal rests, or secondary to inflammation. (7) The theory of embryonal hyperplasia of the alimentary tract endoderm. The persistence of these embryonal occlusions results in the congenital type of intestinal atresias and stenoses.

* From the California Babies' Hospital, pediatric department of the California Hospital.

* Read before the Los Angeles Clinical and Pathological Society, March 23, 1933.

SYMPTOMS

There may be death *in utero* with the pathology present or, if the child is born alive, an early death. There is abdominal distention, dilated superficial blood vessels, a certain amount of rigidity, tympany or dullness, dyspnea and varying degrees of cyanosis. Early vomiting of food, later fecal material. There is crying as an evidence of pain, a varying amount of edema of the lower extremities and icterus also. Aterminal rise of temperature occurs. The infant usually nurses well the first few days of life, but the bowels may or may not move. There may be other congenital defects.

REPORT OF CASE

On the service of Dr. Joseph Nicholson, a male was born spontaneously, November 15, 1931, after a 26-hour first-stage and 15-minute second-stage labor. The birth weight was 4 pounds 14 ounces. The infant was about one month premature.

The prenatal history was that of a normal pregnancy with no venereal history, and no known cause for the premature delivery.

The infant's length was 18½ inches, the head 12 inches in circumference, and the shoulders 12½ inches. No gross congenital deformities were noted.

In the placenta there were several infarcts, and evidence of an old hemorrhagic area centrally placed.

From November 15 to 19, inclusive, the baby was fed with breast and bottle, the weight, however, declining to 4 pounds 7½ ounces. On November 19 the weight rose to 4 pounds 10 ounces, which was held until the eighth day.

The stools, from November 16 to 20, were meconium, and the next two days were tinged yellow and green, with green and yellow curds.

On the evening of November 19, pitting edema was noted in the lower extremities and up the thighs, on to the abdomen as far as the umbilicus. The skin was reddened, and the abdominal vessels were prominent. The legs were cold, spastic and extended. Reflexes were present only in the feet. The abdomen was distended and tense, but the cord-stump seemed normal. The upper extremities were spastic, but not edematous. The fingers were fully extended. The heart was normal and the lungs clear. The infant was toxic but not restless, and did not cry easily.

The urinalysis showed faint trace of albumen, a few epithelial cells, leukocytes, and bacteria.

Blood Count.—Hemoglobin, 102 per cent; erythrocytes, 5,392,000; color index, 0.94; leukocytes, 6,100; polymorphonuclears, 64 per cent; and lymphocytes, 33 per cent.

A few myelocytes, and occasional red cell showing basophilic stippling, and occasional nucleated red cell and a slight degree of polychromatophilia. The platelets appeared normal.

The temperature the first four days of life was between 97 and 98 degrees; but on November 19 it was up to 98.6.

When we saw the infant we advised putting it in an incubator, to raise the body temperature, and give only breast milk every four hours, with water between feedings.

On November 20 the infant was considerably warmer and more active, although the legs were still very hard from the edema.

On November 21 there was less edema of the legs, but the scrotum was now markedly edematous. The abdomen was still distended, but not so tense. On November 22 there was slight blood tinge to the stool.

It was suggested to take a roentgenogram, to see if we could learn anything, as we did not consider the child a good surgical risk. The report was: A dilated esophagus, with the stomach of normal size. The heart was normal in size and shape. The diaphragm was of normal level and curvature. There was much free air or gas in the peritoneal cavity, suggesting a perforation of the intestinal tract distal to the duodenum.

The infant died at 3:45 p. m. on November 22, 1931.

Autopsy by Dr. A. H. Zeiler, performed November 22, 1931.—"Body was that of a premature male infant said to be eight days old. The stump of the dried cord was still attached. There were no scars. The abdomen was distended, and a mass could be palpated in the lower half. This mass was globular in shape and seemed to fill most of the lower half of the abdomen and pelvis. The abdomen was found to be the seat of a diffuse peritonitis, with loops of small intestine matted together in the pelvis and covered with yellow fecal material as well as fibrin and pus. The loops of intestine in the upper abdomen were deeply injected and covered with pus, but the fecal matter appeared to be mainly in the pelvic region. The mass that was felt through the abdomen was found to be the matted-together loops of small intestine.

"The umbilicus and round ligament of the liver, as well as the remains of a hypogastric artery, were dissected out, but evidence of infection could not be traced along these structures. The spleen, liver, gallbladder and kidneys, excepting for the peritonitis, were essentially negative.

"On separating the head of the cecum about one centimeter from the base of the appendix, a small pinhead opening was found on the lateral surface. There was an escape of putty-like fecal matter through this area. It was difficult to determine whether this opening occurred postmortem, due to separation of adhesions, or whether it was an antemortem perforation. The dissection was blunt and very gentle, and it seems probable that the opening was antemortem. This was somewhat corroborated by the presence of fecal matter in the pelvis before any dissection and by x-ray films.

"The large intestine was dissected out and found to be the seat of an ulcerative colitis, with the ulcers mainly in the sigmoid and descending colon.

"Thorax: The lungs were well aerated. There was a moderate amount of hypostatic congestion, but no consolidation. The heart and thymus were negative.

"Microscopic: Sections at different levels of the colon revealed an acute ulcerative colitis. Some of the ulcers were membranous in character. They extended down into and through the submucosa. There was a mild acute inflammation in the serous layer. There was no ulceration at the point of perforation, but on either side the mucosa was superficially ulcerated. There was nothing about the histological appearance of the perforation to prove or disprove whether it was ante- or postmortem.

"Anatomical Diagnosis.—(1) Prematurity; (2) acute diffuse peritonitis; (3) acute ulcerative colitis; (4)perforation at the head of the cecum."

SUMMARY AND CONCLUSION

1. A new-born infant is reported with an ulcerated colitis, which ruptured into the peritoneal cavity.

2. The etiologic factor in this case is in doubt, but probably some antenatal condition.

3. Surgery is very unsatisfactory in this condition, and the prognosis is uniformly fatal.

4. No bacteriologic study was made on account of the fecal contamination.†

1401 South Hope Street.

REFERENCE

1. Abt, Isaac: Fetal Peritonitis, Clinics of North America, Vol. 15, No. 3, pp. 611 et seq. (Nov.), 1931.

† Our thanks are due Dr. Joseph Nicholson for the privilege of seeing this infant, and for permission to report the findings.

BEDSIDE MEDICINE FOR BEDSIDE DOCTORS

An Open Forum for brief discussions of the workaday problems of the bedside doctor. Suggestions of subjects for discussions invited.

ACUTE EAR DISEASE IN CHILDHOOD

WALLACE B. SMITH, M. D. (490 Post Street, San Francisco).—*Symptoms.* In any discussion on the symptoms of acute ears in childhood, it is well to bear in mind that there is greater variability in the degree, as well as in the combination of symptoms in this, than in perhaps any other of the acute inflammatory diseases. We ordinarily divide the symptoms into those due to the reaction of the general system to the infection, and those due to the reaction of the middle ear and neighborhood. The general symptoms are similar to those of any of the acute inflammatory diseases, fever, malaise, anorexia, increased white blood count, with percentage increase of the polymorphonuclears; the fever being highest in the afternoon and ranging as high as 105 degrees. The local symptoms are pain, discoloration of the drum, loss of its details, and bulging. The discoloration varies from lack of luster to marked redness. There are two variations of importance: one in which blebs cover a portion or whole of the drum, and sometimes extend on to the external canal; the other, the grey drum. The former is usually indicative of the influenza organism as the cause of the otitis, and by the latter is meant the lusterless, grey-colored drum, usually due to sodden epithelium. It is easily wiped away, and the red drum is found underneath. The loss of details of the drum and bulging do not need further elaboration.

Fever is the outstanding symptom during any and all stages of an acute infection of the middle ear and mastoid, and any of the complications arising from it. When one is called to see a patient with fever of fairly rapid onset, and associated with severe pain in the ear and reddened drum, the diagnosis is simple and needs no discussion. If the fever is of more gradual onset, the appearance of the drum is pale, lusterless, details present, and with little or no complaint of pain, the diagnosis is less obvious. This condition may continue for several days with no apparent change save an increase in fever to 103-105 degrees. A close inquiry will usually bring out the history of a previous acute cold.

Most of us approach these patients with the feeling of arriving at a diagnosis by considering and excluding the following: (*a*) pyelitis, if the patient is a girl, and carry in our minds that there may elapse a period of from one to four or five days in a pyelitis before pus cells are present in sufficient quantity for diagnosis; (*b*) pneumonia, and that we may not be able to detect a central pneumonia until consolidation comes nearer the surface or recourse is had to the x-ray; (*c*) tonsillitis, which is more easily diagnosed and is of short duration—three to five days.

Once discharge from the middle ear has been established either by spontaneous rupture or incision of the drum, the fever usually recedes but does not become normal, and we enter a period of freedom from pain, a profuse discharge, and a general improvement. The great majority of cases go on to recovery from this point.

If from any of several reasons, such as virulence of the infecting organism, lowered resistance of the patient, anatomical formation of the middle ear, eustachian, or pneumatization of the temporal bone, we are to have a mastoiditis, we should bear in mind certain facts which, from long experience and careful observation, have become landmarks in otology. The common pathologic form of mastoiditis is the acute coalescent type which takes two full weeks to develop, and for this reason the third week is the week of complications; so that symptoms during and after the third week have greater significance than during the time before discharge is established and for almost two weeks afterward. The high fever before perforation or incision means less than a fever of, say, 102 degrees after the second week. Mastoid tenderness is rather generally present early in the infection, even before rupture, and does not mean surgical mastoiditis. It usually subsides within a few days. The tenderness which develops after two weeks, however, has other significance, especially if certain anatomical points of tenderness are observed; though not all points are equally involved, and not all are necessarily involved at the same time. They are the tip of the mastoid, the point corresponding to the antrum, the point corresponding to the superior border of the petrous bone, the region posterior to the course of the sigmoid sinus before it turns up to form the bulb, and the posterior portion of the zygoma in front of the ear. There also develops a certain character of the pus which is an aid, but is rather an intangible sign. For instance, pus from the breaking down of the intercellular bone does not contain mucus; the mucoid element in the ear discharge is contributed by the mucous membrane of the middle ear. The pus of a coalescent type of mastoiditis has a larger element of bony pus than mucoid material, though both are present. The bone pus is of cream-like consistence, yellowish grey, and not having mucin does not "string" out when wiped away with cotton-tipped applicator; and, the third week increase in quantity of the discharge will indicate more than just a middle-ear involvement. The sagging of the posterior superior wall which occurs at this time must extend the length of the canal from the drum outward. If it is located only in the cartilaginous portion of the canal, it has no relation to mastoiditis. And, lastly, the continuous diag-

nostic exclusion of other diseases showing pyogenic temperature curves, attention being called again to those previously mentioned, namely, pyelitis, pneumonia, and tonsillitis. If the condition has been unilateral, the good ear must be seen daily. Often there is involvement of the cervical gland by the original infection which caused the otitis. These cases have at times been the cause of a close differential diagnostic study in probable mastoiditis, as the problem may hang on what is the cause of the fever, the middle ear—mastoid, or the cervical adenitis.

Blood counts give information which is of value, but like that derived from blood culture and x-ray studies, it should rarely, if ever, be the deciding point of a surgical interference either pro or con in the coalescent type of mastoiditis.

The other pathologic type of mastoiditis, known as the osteothrombophlebitic type, in which the small vessels of the mastoid are early filled with thrombi—these in turn acting as pathways of infection to the intracranium and to the blood stream—run such a stormy course that diagnosis and procedure are usually obvious. The fever is very high, the pain of the middle ear infection is also in the mastoid, the discharge is serosanguineous and profuse, there is exquisite tenderness over the whole mastoid and beyond, general prostration is present with severe headache on the affected side, blood count high, percentage of polynuclears high, and if the blood culture is taken at the right time it is apt to be positive. And as it may run a fatal course before there is any breaking down of the bone, the x-ray will not be a benefit, nor will there be sagging of the posterior superior wall. This clinical picture is different from that of a severe otitis media in which we have a continuation of the fever for four or five days after the establishment of drainage. In the otitis media the fever is the only outstanding symptom and the other symptoms are not out of their customary proportion. Fortunately the osteothrombophlebitic type of mastoiditis is only met with occasionally, and for that reason in our daily practice it does not occupy the place of importance of the coalescent type.

Local conditions around the ear which resemble mastoiditis and which must be excluded, are:

(*a*) Swelling and redness on the mastoid process due to infection of the postauricular lymph node to which infection drains from the scalp on that half of the head. Any comb scratch, sore, or scalp break may give entry to the lymph stream of an infection sufficient to infect this node. The consequent swelling and redness of the soft parts over the mastoid are typical of an acute mastoiditis, with rupture through the mastoid cortex and soft part involvement. In lymph node infection the drum is normal, as is the hearing, and there is no discharge.

(*b*) Extension of the swelling of an external otitis from the external canal over the mastoid bone.

(*c*) Erysipelas starting in the folds of skin around the cartilage of the external ear which will produce a swelling simulating that due to mastoiditis. Erysipelas is not an infrequent visitor to this region, and usually runs a mild course.

* * *

Simon Jesberg, M. D. (500 South Lucas Avenue, Los Angeles).—*Treatment.* The incidence of acute middle ear infections is much greater in children than in adults. This is due probably to the greater susceptibility of children to upper respiratory tract infections, and the preponderance of lymphoid tissue in the throat and epipharynx, as well as a greater patency of the eustachian tubes. In addition, contagious diseases, mainly measles and scarlet fever, are more prevalent in childhood. These are often complicated by ear involvement.

The diagnosis of middle-ear involvement is made by direct inspection of the drum membrane. Redness of the drum with obliteration of the landmarks can be taken as a reliable sign of middle ear involvement. In very young children the drum does not bulge as much as in older children and, therefore, this sign is often lacking, or little in evidence. On the other hand, the systemic symptoms are much more pronounced in younger children, fever is often high and convulsions may occur. There are all gradations of severity of infection, showing as signs from a mild hyperemia of the drum to signs of intense inflammation and with systemic symptoms in accord.

When the diagnosis of middle ear infection is definitely made, the course of treatment is indicated by the severity of symptoms and the local findings. If there is only a mild systemic reaction and the drums show no great change, one is justified in waiting and using some palliative treatment, the favorite being phenolized glycerin. A few drops of five per cent phenol in glycerin are warmed and instilled into the ear canal. This will allay the earache in most mild infections. If these symptoms do not abate in twenty-four hours, or if there is evidence that the condition is getting worse, such palliative measures should not be further relied upon.

Middle ear infections, except those mild inflammations of transient duration, demand drainage and the sooner this is instituted the quicker will the disease be cured. To deliberately wait for spontaneous rupture of the drum to occur is absolutely unjustifiable. While nature thus attempts to relieve the condition, there is grave danger of extension to the mastoid cells, an extension that probably would not happen if early artificial drainage had been provided by a drum incision. Moreover, a drum properly incised never fails to heal after the infection is cleared up, but spontaneous ruptures of the drum often leave a permanent opening. A good rule to follow is: "When in doubt, open the drums." This applies particularly to ear infections in young children; and while the symptoms are perhaps never severe, still there is persisting evidence of middle ear inflammation. Sometimes the severity of the systemic symptoms are out of all proportion to the local ear findings, yet when the drum is incised the whole picture takes a definite turn for the better.

Anesthesia.—Ether is my preference. It is given with an open mask or a handkerchief over the

mouth and nose. Induction is as rapid as possible without suffocation. In about sixty seconds the child is sufficiently anesthetized to perform the incision and wakes promptly, usually in a pleasant state of mind. Ethyl chlorid, while technically more dangerous, is also satisfactory. Nitrous oxid is more inconvenient to give, but is generally satisfactory. As there is usually an acute respiratory infection present the use of ether has been thought by some to be contraindicated. I do not believe that, given as described above, there is any added risk by using ether.

Local Anesthesia. — Bonain's solution; equal parts of cocain, menthol and phenol, is about the best. Even this, however, does not ordinarily produce complete anesthesia. A minute fragment of cotton, loosely wrapped on the end of an applicator, is dipped into the solution. It is then removed from the applicator with a fine Hartman forceps and laid on the drum. Analgesia is produced in from twenty to thirty minutes. It is a poor policy that inflicts unnecessary pain on a young child, thereby making it intractable, not to consider the permanent results of psychic trauma. To attempt to perform a myringotomy without any anesthesia is beyond my conception of a physician's duty.

If spontaneous rupture occurs, one should carefully observe that drainage is adequate. Usually a myringotomy should also be done.

Cleansing of the Ear Canal.—It is essential that the canal be kept free of pus by some means that does not favor complications. Irrigation of the ear can be an agent for good or evil in the course of the disease. Inasmuch as it is the most used method, certain factors should be considered. Pressure applied by either plugging the canal or using too strong a stream may favor extension of the infection. Solutions should be sterile, isotonic, and the solution temperature should not be over 110 degrees Fahrenheit. The method I have found most practical for home treatment is the use of physiological salt solution with one per cent sodium bicarbonate introduced with a soft rubber ear and ulcer syringe. The mother is carefully instructed to straighten the canal by traction on the pinna. The tip is placed just within the meatus and a gentle stream is directed toward the drum. One or two syringefuls are enough to cleanse the canal of all pus. It is needless to say that the solution and syringe are sterilized by boiling.

Dry Treatment.—A small twist of sterile cotton wound on an applicator, and so that it projects beyond the end, is placed in the canal. The tip of the wick should be in contact with the drum. This is changed frequently, as often as every ten or fifteen minutes when the discharge is profuse. The more I use this dry treatment the less I think of irrigation, and I believe that it is better adapted for the promotion of drainage which, after all, is the end in view.

One must be on the alert for mastoid complications, but one should never become much concerned by symptoms pointing to mastoid inflammation until the middle ear has been adequately drained for forty-eight hours. It is not an uncommon occurrence to have retro-auricular swelling in very young children, which completely subsides after adequately draining the middle ear by myringotomy. The early decision on mastoid operation without adequate middle ear drainage is certainly not in keeping with the honorable practice of our profession. When symptoms of mastoiditis persist after the middle ear has been properly cared for, surgical intervention may be indicated. By far the greatest number of actual mastoid infections get well by proper middle ear drainage, but when progress toward recovery stops, operation on the mastoid must be considered. Symptoms pointing toward intracranial involvement generally are indications for mastoidectomy.

In young children, ear infections associated with severe gastro-enteritis (Mariot's syndrome) bring about a most distressing condition and often a fatal termination. Here a rapidly performed antrotomy may save the child's life. A prolonged operation should not be considered and, fortunately, children of this age have only one or two mastoid cells, which can be drained in a few minutes with a turn or two of a curette.

Middle ear suppuration that persists for more than three weeks, even without appreciable systemic symptoms, demands a consideration of the mastoid condition. The determination as to whether mastoid drainage is necessary will require x-ray study in many cases.

Finally, it is my opinion that tonsil and adenoid surgery should not be undertaken while there is acute or subacute suppuration of the middle ear. I have observed several times a lighting up of complications that probably would not have occurred had the tonsil surgery been deferred.

* * *

Howard W. Fleming, M. D. (384 Post Street, San Francisco). — *Complications.* The complications of acute and chronic infections of the ear are serious. Though only a small percentage of the total number of patients with otitis media develop intracranial complications, the resultant mortality of such complications is high and, therefore, chronic running ear is to be considered a potential danger.

Yeager reports that 10 per cent of the patients with suppurative otitis media, entering Cook County Hospital, had intracranial complications. This high incidence probably is explained by the fact that only seriously ill patients were admitted to the wards. The most common complication was meningitis, which comprised five per cent of all cases in Yeager's series; sinus thrombosis accounted for three per cent; and brain abscess for two per cent. Labyrinthitis is a less common complication.

Prophylactic measures should receive the chief emphasis. No doubt this phase of the subject will be covered adequately by the otologists. I feel, however, that the menace of the chronic running ear is not appreciated by the profession as a whole, and certainly not by the laity.

Meningitis, the most frequent complication, is by far the most serious. Many otologists feel that a true meningitis of otitic origin is always fatal. In their opinion the recovery of a patient on whom

such a diagnosis was made is indicative of a mistaken diagnosis. This extremely pessimistic outlook is hardly justified in view of the many carefully observed patients who have survived. We certainly are not justified in withholding therapeutic efforts, even though the hope of recovery is extremely slight.

Unfortunately, cases of meningitis, brain abscess, and sinus thrombosis frequently do not present the classical textbook pictures. However, a careful examination usually will elicit some symptoms or signs that denote an intracranial complication. Headache, nausea, vomiting, and stupor are symptoms of increased intracranial pressure. Paresis, numbness, aphasia, incoördination and defects in the visual fields are significant localizing signs. The presence of Kernig's sign and stiff neck, in association with chills and fever, denotes an infectious intracranial process.

Given findings which indicate that some intracranial complication is developing, the following diagnostic procedures are of value in determining the site and nature of the disease process. The history of acute or chronic infection of the ear is a good lead as to the source of the infection, but one must not lose sight of the fact that there may be some other coexisting etiologic factor. Epidemic meningitis, pulmonary infection, nasal sinusitis, tuberculosis, and syphilis should be considered.

Very careful examination, particularly of the nervous system, often will give important localizing signs. These examinations, repeated frequently, will disclose signs that usually suggest and often confirm the diagnosis. Defects in the visual fields frequently are the determining factor in the diagnosis of abscess of the temporal lobe. Only too often this important diagnostic test is omitted while the patient is still coöperative.

As a rule the temperature, pulse and leukocyte count are increased markedly in cases of meningitis and sinus thrombosis, whereas brain abscess rarely causes marked general systemic reactions. Suggestive symptoms of septicemia indicate the necessity of blood cultures.

X-ray examinations frequently are helpful. Diseased mastoids or infected sinuses suggest the focus that must be eliminated. A lateral shift of the pineal shadow is diagnostic of a space-consuming lesion, probably an abscess, in the syndrome under consideration.

Spinal puncture is probably the examination of greatest value. The risk of medullary herniation or infection is minimal if the procedure is done carefully, and the value of the information obtained far outweighs the dangers involved. The intraspinal pressure should be measured carefully by means of a manometer. Estimation by the number of drops per minute, or the length and force of the stream, is inadequate. The pressure is increased in all the conditions under consideration, and a normal or low pressure is of negative value.

There is considerable debate as to the value of the Quackenstedt test in cases of sinus thrombosis. Questionable reactions may leave one in doubt, but evidence of block is strong confirmation of sinus involvement. It is well to remember that, in a large percentage of people, the right lateral sinus and jugular vein convey a larger amount of blood, and an obstruction of this side is of more significance than one of the left side.

Laboratory examination of the fluid will determine the number of cells present and their type. Meningitis usually is characterized by a high cell count, ranging from a few hundred to several thousand. Brain abscess and sinus thrombosis, if uncomplicated, rarely show more than fifty cells. Only too frequently these conditions may be complicated by each other.

The demonstration of bacteria by stained smear or culture is the only criterion on which true meningitis can be diagnosed. The absence of bacteria, even in the presence of many cells, gives a much more hopeful prognosis. No doubt many of the cases of meningitis secondary to ear infection in which cure was obtained, were cases of sterile or serous meningitis.

The type of organism responsible for the infection influences the prognosis very materially. Tuberculous or pneumococcal meningitis is almost invariably fatal. Streptococcal or influenzal meningitis offers a somewhat better prognosis.

A detailed description of the treatment of meningitis, abscess, and sinus thrombosis is not practical. Very few surgeons agree as to the methods, and each case presents a problem of its own. Only a few general principles can be given here.

The focus of infection should be drained thoroughly as soon as possible. This usually requires a mastoidectomy. The clinical picture will suggest the necessity of adequate exposure of the lateral sinus, or the dura in the middle or posterior fossa. The pathologic changes disclosed at operation, in conjunction with the clinical picture, will determine the advisability of opening the sinus and tying the jugular vein, or exploring the brain for abscess.

Personally, I feel that in cases of true meningitis, lumbar drainage by frequent spinal puncture or laminectomy is in order after adequate drainage of the focus is obtained. I have seen patients with true meningitis, secondary to sinus or ear infection, recover when this method was employed. Also all patients for whom constant drainage was employed lived far longer and seemed to have a much better chance of survival than those patients treated without it.

The prognosis in brain abscess is far better. The type and virulence of the organism, and the ability of the brain to form a protective wall about the abscess, largely determine the prognosis. There is much discussion as to the methods of evacuating the abscess, but I think there is uniform agreement that the longer one can wait before instituting surgical interference the better is the outlook.

In conclusion, I wish to emphasize the prevention, if possible, of chronic suppurative disease of the ear; the proper care of such disease if present; the seriousness of intracranial complications and the desirability of their early diagnosis; and, finally, the necessity for active and sustained therapeutic effort in all such cases.

California and Western Medicine

Owned and Published by the

CALIFORNIA MEDICAL ASSOCIATION

Official Organ of the California and Nevada Medical Associations

FOUR FIFTY SUTTER, ROOM 2004, SAN FRANCISCO

Telephone Douglas 0062

Address communications to the EDITOR, as per the above address.

EDITOR . . . . . GEORGE H. KRESS
Associate Editor for California . . . . EMMA W. POPE
Associate Editor for Nevada . . . . HORACE J. BROWN

Advertising Representative for Northern California . . . . . L. J. FLYNN, 544 Market Street, San Francisco

Subscription prices, $5.00 ($6.00 for foreign countries); single copies, 50 cents.

Volumes begin with the first of January and the first of July. Subscriptions may commence at any time.

Change of Address.—Request for change of address should give both the old and the new address. No change in any address on the mailing list will be made until such change is requested by county secretaries or by the member concerned.

Advertisements.—The journal is published on the seventh of the month. Advertising copy must be received not later than the 15th of the month preceding issue. Advertising rates will be sent on request.

Responsibility for Statements and Conclusions in Original Articles.—Authors are responsible for all statements, conclusions and methods of presenting their subjects. These may or may not be in harmony with the views of the editorial staff. It is aimed to permit authors to have as wide latitude as the general policy of the journal and the demands on its space may permit. The right to reduce or reject any article is always reserved.

Contributions—Exclusive Publication.—Articles are accepted for publication on condition that they are contributed solely to this journal.

Leaflet Regarding Rules of Publication. — California and Western Medicine has prepared a leaflet explaining its rules regarding publication. This leaflet gives suggestions on the preparation of manuscripts and of illustrations. It is suggested that contributors to this journal write to its office requesting a copy of this leaflet.

EDITORIALS*

CALIFORNIA BOARD OF MEDICAL EXAMINERS AND EUROPEAN GRADUATES

Resolutions Regarding Graduates of European Medical Schools. — At the meeting on July 13, 1933, of the Board of Medical Examiners of the State of California, a resolution, which is appended to these comments, was adopted. The resolution outlines the conditions which the Board of Medical Examiners, by virtue of the powers vested in it through the State Medical Practice Act, has seen fit to demand of all graduates of European medical schools seeking legal license to practice medicine and surgery in California. A perusal of the resolution reveals that it deals with two groups of licensure applicants: one, with American students who have gone abroad to secure there their training and medical degrees, and another, with foreign citizens who, after receiving such medical training abroad, have migrated to America and wish the legal permission to practice in the State of California.

Matriculation Figures of the Scholastic Year 1932-1933.—It may be interesting in this connection to note, first, the extent to which American students are today matriculating in the medical schools of the United States. The figures here given are for the scholastic year 1932-1933: first-year students, 6,426; second-year students, 5,479; third-year students, 5,017; fourth-year students, 4,948; or, for the four classes, a total of 21,870 matriculants for the scholastic year 1932-1933. Not without significance, also, is the fact that when the fall term of 1933 began, a few months ago, there were some 31,429 applications for entrance to first-year classes. To be sure, this large number represented duplications, because some students had applied to two or more schools. There were actually 12,280 different applicants; and of this number, 7,357 were deemed to have satisfactory credentials, but 4,923 applicants were refused. Of 7,357 freshman students admitted last year, 6,426 completed the freshman year work. In this connection it may be stated that there are four Class A medical schools in California: University of California, Stanford University, University of Southern California, and the College of Medical Evangelists; the first two located in San Francisco, and the last two in Los Angeles. All had fourfold or more applicants for admission than could be accepted. It is evident, therefore, that the present-day economic stress has in no way decreased the number of young Americans seeking to prepare themselves for professional careers. Professions other than medicine, such as law and engineering, present figures in line with those given above.

* * *

Many Applicants with Unsatisfactory Credentials Matriculate in European Schools.—It was stated that 4,923 applicants were found to have had unsatisfactory credentials. That the refusal by American institutions failed to daunt many in this rejected group (who probably also had parents possessing means to permit of their training elsewhere) is shown by the fact that eighty-two European medical schools reported a total enrollment of 1,911 American students! This phenomenon of American undergraduates taking their medical training abroad is quite comparatively recent, and has been construed as a "back door" method of securing a medical degree that would make for eligibility to take a state board examination by those whose preliminary education was insufficient for matriculation into American medical schools.

* * *

American Medical Boards Alert to the Menace.—Throughout the United States, members of state medical boards during the last few years have been quite disturbed at this new menace to the medical and licensure standards of the several states. The Federation of State Medical Boards of the United States some time ago passed resolutions of tenor similar to those adopted by the Board of Medical Examiners of the State of California.

*Editorials on subjects of scientific and clinical interest, contributed by members of the California Medical Association, are printed in the Editorial Comments column, which follows.

The California resolutions, in brief, provide that an American matriculating in a European school subsequent to the present academic year shall be called upon to procure proper examining board credentials before going abroad, must satisfactorily pursue a course of training equivalent to that demanded of California students, and when a medical degree has been obtained abroad, must secure a license to practice in the country in which his degree-granting school is located.

The resolution also provides that a foreigner who possesses a medical degree granted by a foreign institution, must give evidence that the school from which he was graduated maintains standards equivalent to those of the accepted schools of America. He must also pursue a fourth-year course in an American medical school, or, in lieu thereof, have a two years' internship credit in an approved hospital of the United States. It may be assumed that these provisions are in harmony with the viewpoints of the majority of physicians who are in active practice.

* * *

Text of the California Board Resolutions.—The resolutions adopted by the California Board at its July 13 meeting, follow:

WHEREAS, An increasing number of medical students are leaving the United States for the purpose of studying medicine in foreign countries; and

WHEREAS, The standards of medical education in other countries are not always equal to the high standard maintained by approved medical colleges in the United States; and

WHEREAS, It appears from the experience of the California Board of Medical Examiners that it is becoming increasingly difficult to verify the medical credentials of applicants to this Board who claim to have completed a full course of medical study in some foreign country; and

WHEREAS, The standard of preliminary, premedical and medical educational requirements exacted of graduates of medical colleges is specifically set forth in the Medical Practice Act of the State of California; now, therefore, be it

Resolved, That no American student matriculating in a foreign medical school subsequent to the academic year 1932-1933 will be admitted to a written examination for a license to practice under the provisions of the Medical Practice Act of the State of California, who, before commencing his course of medical study, does not secure from some state board of medical examiners in the United States, or other competent state authority in the United States, a certificate satisfactory to the Board of Medical Examiners of the State of California showing that, prior to commencing the study of medicine, said applicant has completed at least a one-year course of college grade in the subjects of physics, chemistry and biology, as set forth in Section 9 of the California Medical Practice Act; and be it further

Resolved, That no student matriculating in a foreign medical school subsequent to the academic year 1932-1933 will be admitted to examination for a license to practice under the provisions of the California Medical Practice Act, who does not present evidence satisfactory to the Board of Medical Examiners of this State showing that he has fulfilled the premedical educational requirement heretofore mentioned and, in addition thereto, has graduated from a foreign medical school after completion of a medical course of at least four academic years, comprising no less than four terms of thirty-two weeks each, totaling four thousand hours, as required under Section 10 of the Medical Practice Act; and be it further

Resolved, That, in addition to the above mentioned premedical and medical education, each graduate of a foreign medical college who applies for a license to practice as a physician and surgeon in the State of California must present satisfactory evidence to the Board of Medical Examiners of this state that he has obtained a license to practice medicine in the country in which is located the medical school wherein he completed said course of medical instruction; and be it further

Resolved, That, in addition to the above requirements, any graduate of a foreign medical college, who presents satisfactory evidence to the California Board of Medical Examiners that he has fulfilled the above stated requirements of premedical and medical education, must, in addition to the above last-mentioned requirement, show satisfactory evidence that he has completed the fourth-year course in an approved medical school located in the United States or Canada, or, in lieu thereof, has completed a two-year internship in a hospital located in the United States and which said hospital is on the approved list compiled and/or published by the Council on Medical Education and Hospitals of the American Medical Association; and be it further

Resolved, That graduates of approved medical colleges located in the Dominion of Canada shall be exempt from that portion of this resolution relating to the fourth-year study in an approved United States medical college, or, in lieu thereof, a two-year hospital internship.

THE SAN FERNANDO PLAN—A HEALTH CENTER CURATIVE CLINIC EXPERIMENT

"Health Centers" of Los Angeles County.—Several years ago, because of the great increase of population in Los Angeles County, and other factors, this county instituted, as a part of the Health Department, the first of its health centers, of which there are now about one dozen. These health centers were established in different portions of this geographically large county, and were situated either in unincorporated territory, or in cities and towns which, by yearly contract, had turned over their public health work to the county's Health Department. The grounds and buildings of some centers were entirely paid for with county tax funds, but in other places local communities or individuals made donations to the building funds.

It was originally planned that each health center should not only be a central office and distributing point of local public health service, but should also have in connection therewith (where needs were so indicated) a curative clinic manned by local physicians and giving gratuitous service to the indigent sick of the district. However, as time went on, misunderstandings arose in several of the health centers between the personnels of the preventive public health work and the curative clinics, culminating finally in the adoption by the Board of Supervisors of a new plan whereby the curative clinics housed in the health center buildings became part and parcel of the out-patient service of the Los Angeles County General Hospital; the health center curative clinic staffs being appointed in a manner similar to other County Hospital staffs, and supervised by the executives of that institution.

* * *

Why the San Fernando Plan Came Into Being.—But even this much more desirable arrangement was found to be lacking in some important essen-

tials, and the executive medical board of the County Hospital and the Los Angeles County Medical Association saw fit to recommend to the Board of Supervisors, through the County Welfare Department (of which the County Hospital is a unit) that the curative clinic in the city of San Fernando be discontinued, and that the work of caring for the indigent sick of that community be done in the private offices of the physicians who had been serving gratuitously in that local curative clinic. There was attached the further proviso that, for each socially serviced indigent patient who in regular course was referred to such a physician's office and treated, the physician should receive a nominal stipend of fifty cents per patient treated, for use of his personal equipment and office facilities.

* * *

A Preliminary Estimate of the Worth of the Plan.—The plan has been in operation for only about four months, and complicating factors (incident to charges for health center building upkeep and other items) have made it difficult to come to any final conclusions as to all the merits and the demerits of the new plan. It may be stated, however, that the members of the profession at San Fernando seemingly prefer the new method of procedure to the former clinic in the health center building, and that the plan also continues to have the approval and support of the administration of the Los Angeles County Hospital. At a meeting of the County Hospital executive medical board, held several days before the time of our writing, figures were submitted showing that, at the end of three or four months of the experiment under the new system of socially serviced indigent patients who receive treatment in private offices, the number treated was less than had been coming to the clinic in the health center building, and that the actual cost of the service rendered was something like $200 less per month. Mention is made of this new method of procedure, because it is an innovation in this type of work. If the medical and surgical services can be given as efficiently and at less cost to the taxpayers, with preservation of the personal physician-patient relationship, with retention to patient of self-respect through abolition of the pauper complex, and with ever so modest but satisfactory stipends to the staff physicians for the utilization of their offices and equipment, then this new San Fernando plan may find for itself a place in the readjustment procedures now being tried out, in efforts to care for the indigent sick by methods better than those in vogue in the past.

NOBEL PRIZE IN MEDICINE COMES TO CALIFORNIA

Dr. Thomas Hunt Morgan of Pasadena Receives the 1933 Nobel Prize in Medicine.—When one of the Nobel Prizes comes to a State, an institution or an individual, it is a matter of considerable moment. Californians, therefore, are gratified that the 1933 Nobel Prize for medicine should have been bestowed upon Dr. Thomas Hunt Morgan, director of the William G. Kerckhoff biological laboratories of the California Institute of Technology, to which institution he came from Columbia University in 1928. At the November, 1933, meeting of the Southern California Medical Association he was a guest speaker.

Dr. Robert A. Millikan, who is the director of the California Institute of Technology at Pasadena, and who received the Nobel Prize in physics in 1923 for his own achievements in that field, in speaking of the honor to Doctor Morgan, gave an excellent estimate of the doctor's researches, when he said:

"The discoveries that are grouped around the ideas of chromosomes and genes—discoveries which enable us to connect hereditary qualities with actual minute objects observable in microscopes—represent probably as fundamental an advance in biology as has ever been made in history. It is altogether comparable with the discovery of the circulation of the blood by Harvey or of the germ theory of disease by Pasteur. This discovery and the whole group of developments that have been associated with it have been made by a group of Americans, of which Thomas Hunt Morgan has been the universally recognized leader for the past twenty years."

Members of the California Medical Association, in common with other citizens of the State, extend to Doctor Morgan their congratulations at the great honor given to him, and wish for him long years of continued work and pleasure in the field in which, through his own original labors, he has been able to add so much to the world's scientific knowledge.

VIOLATION OF STATE NARCOTIC ACT DANGEROUS

Letters of Doctors Geistweit and Pinkham.—In an open letter printed in last month's (November) CALIFORNIA AND WESTERN MEDICINE (page 357), Dr. W. H. Geistweit, Jr., of San Diego, detailed some of his observations concerning the lack of knowledge possessed by applicants who sought licenses to practice medicine and surgery in California, and who took the July 1933 examination of the California State Board of Medical Examiners. Doctor Geistweit's criticisms of our medical schools, in permitting young men to start out in practice without adequate knowledge of narcotic laws which, if violated, might seriously imperil the future of the transgressors, are, in our opinion, more than justified. Members of the California Medical Association may well take the time to read Examiner Geistweit's comments and to ponder thereon. The attention of the faculties of the four California medical schools is also directed thereto.

Comes now, to the editor, as the December CALIFORNIA AND WESTERN MEDICINE is being prepared for press, another letter, also dealing with the Federal and State Narcotic Acts. With this difference, however, that the criticisms made are directed against physicians in active practice who, if arrested for violation of the State Narcotic Act, would be subjected not only to humiliation, but to the danger of losing much of their practice in the development of which they had given years of effort and service.

The matter is of so much importance that the letters from Dr. C. B. Pinkham, secretary of the California State Board of Medical Examiners, and of Inspector J. W. Davidson, special agent of the board, are here reprinted for the information of California Medical Association members.

* * *

420 State Office Building
Sacramento, California,
November 20, 1933.

Re: Narcotic enforcement.

To the Editor:—We submit herewith enclosed a copy of a report written us by our Special Agent Davidson, dated November 14, 1933, drawing attention to the prevalence of doctors furnishing narcotics to confirmed addicts, based upon an alleged permit which these addicts may carry.

We leave to your judgment whether this merits special mention in "California and Western Medicine" warning doctors against this procedure, and suggesting that they confiscate any alleged "permits" that may come to their attention.

Very truly yours,
C. B. PINKHAM, M. D.,
Secretary-Treasurer.

* * *

San Francisco, California,
November 14, 1933.

Re: Narcotics
(Clarence ———, alias Clarence ———).

Dr. C. B. Pinkham,
Secretary-Treasurer, Board of Medical Examiners,
420 State Office Building,
Sacramento, California.

Dear Doctor:

The Narcotic Division has informed us that recently they have received reports showing the prescribing of morphine sulphate to the above-named addict, in each case stating that this man holds what purports to be a permit from the State Board of Pharmacy for him to have narcotics, as he is suffering from chronic asthma and angina pectoris.

This addict was recently arrested in Pasadena and at that time had $130 in one-dollar bills in his pocket. However, the Municipal Court dismissed the case; reason not known.

From a report filed November 2, 1933, by Dr. ———, Anaheim, California, he furnished this man eighty one-half grain tablets of morphine sulphate, to last one week, stating that this man had been an habitué for twenty-eight years and he furnished him narcotics because of the purported card authorizing the issuance of same.

Regardless of the warnings sent out by the Board, there seems to be no way that we can get the medical profession to use ordinary common sense in the handling of narcotics, and in the case of Clarence ———, the narcotic agent at Los Angeles had requested permission to arrest all of the doctors involved; however, authority so to do was not granted him and he was instructed to confer with the federal narcotic representatives in Los Angeles.

Is there any way that we could get coöperation from the various publishers of county medical bulletins, including "California and Western Medicine," to give publicity to the fact that there is no such authorization under the laws of the State of California or the Federal Government, showing that an addict is authorized to receive narcotics; and if any addict calls at the office of a licentiate and offers any such document, the licentiate should take that document and keep it and immediately notify the police. The issuance of narcotics to addicts upon any such purported document, without the physician first making a physical examination and satisfying himself (the licentiate) that the patient has a pathology indicating the use of narcotics, is a violation of the law, and subjects the licentiate issuing such prescription or furnishing narcotics to such a person, to arrest for violation of the State Narcotic Law, with the subsequent humiliation that goes with it, as well as the reflection upon an honorable profession.

We are informed by those responsible for observance of the State Narcotic Act that if the medical profession insists upon being lax in prescribing narcotics, it may entail arrest in every case, and we are writing this with the hope that some publicity given the matter may engender respect for the state law.

The following named licentiates have recently reported Clarence ———, alias Clarence ———, as having one of these purported permits:

(EDITOR'S NOTE.—List includes two physicians from Pasadena, one from Los Angeles, three from Long Beach, one from Orange, and one from Anaheim. Names are here omitted.)

Very truly yours,
J. W. DAVIDSON,
Special Agent.

EDITORIAL COMMENT*

THE RÔLE OF HYDROGEN ION CONCENTRATION (pH) IN CERTAIN OCULAR SYMPTOMS

The effect of the hydrogen ion concentration in tears or various medicaments dropped into the conjunctival sac seems to have received little or no attention in English or American ophthalmic literature until Gifford and Smith[1] called attention to it recently. A number of foreign investigators have published reports on the hydrogen ion concentration in normal tears, but they are by no means in agreement. Some investigation of the pH of tears in pathologic states have been recorded, notably those of Oguchi and Nakashima,[2] who worked principally on trachoma. They devised a technique for estimating the pH of conjunctival secretions as distinguished from the pH of the tears.

Gifford and Smith pointed out the advantages of suitably buffered solutions as a vehicle for the common therapeutic agents used in the eye, but the correlation of certain ocular symptoms with the hydrogen ion content of the tears has not been sufficiently studied, nor has the relief of symptoms, which is possible by a modification of the pH of the fluids in contact with the cornea and conjunctiva, been adequately investigated.

Therapy of corneal and conjunctival conditions is at present empirical and far from satisfactory.

* This department of CALIFORNIA AND WESTERN MEDICINE presents editorial comment by contributing members on items of medical progress, science and practice, and on topics from recent medical books or journals. An invitation is extended to all members of the California and Nevada Medical Associations to submit brief editorial discussions suitable for publication in this department. No presentation should be over five hundred words in length.

1 Gifford and Smith: Effect of Reaction on Ophthalmic Solutions, Arch. Ophth., Vol. 9 (Feb.), 1933.

2 Oguchi and Nakashima: Hydrogen Ion Concentration of the Tears, Arch. f. Ophth., 119:300, 1927.

It is possible that much of the good effect attributed to various therapeutic agents depends on a modification of the pH of the tears. It is a suggestive fact that the rate of healing of the bruises sustained by ornamental tropical fish during shipment is profoundly modified by the pH of the water in which they live. Substances of the right degree of solubility and dissociation to produce a prolonged but slight modification of the pH of tears are by no means easy to find or devise, yet such substances probably offer therapeutic possibilities of great value. The effect of the pH on the bacteriolytic enzyme, lysozyme, must be considered. The efficiency of this enzyme is impaired by comparatively small amounts of acid or alkali, as well as by other chemical reagents.[3]

Cell permeability is greatly modified by reaction; for example, a one per cent cocain solution at pH 8.7 is seven times more powerful than the same solution at pH 3.2.[4] Many students of glaucoma believe that its cause lies in the altered permeability of cells to ions and water, and that the pH of the intra-ocular fluids plays an important part in the disease and in its treatment with drugs. As the cornea acts as a semi-permeable membrane, it is conceivable that the pH of the tears has some relation to that disease. The rôle of the other ions present in the tears, particularly the chlorid ion, may be a fruitful field of investigation.

In the not distant future, apparatus for the determination of hydrogen ion concentration may become as essential as the ophthalmoscope to the practice of ophthalmology.

490 Post Street.

GEORGE N. HOSFORD,
San Francisco.

RELAPSING FEVER IN CALIFORNIA*

DURING the past three years, studies have been made of several California strains of relapsing fever spirochetes, of human and animal origin. Comparisons have been made between some of these strains and *Sp. novyi, Sp. duttoni,* and certain Texas strains. The work has been detailed in four papers, which will appear in the *Journal of Infectious Diseases.*

This report merely summarizes some of the outstanding opinions and conclusions of the author regarding the California strains.

1. Three human strains cause a more severe infection in mice than either *Sp. novyi* or *Sp. duttoni.* This may be due to the more recent isolation of the former.

2. Symptoms in mice which were attributable to nerve lesions were noted.

3. Cryptic infections in guinea-pigs were observed with two strains. The serum of these animals was not protective. In later work, typical infections in guinea-pigs were obtained, and their serums showed protective properties.

4. There appeared to be little, if any, difference in the virulence of blood taken during the primary attack and the first two relapses.

5. Immunity of variable duration is produced in mice by California strains. It makes no difference whether the test inoculations are made with blood from the same or a different stage of the disease from that which produced immunity.

6. There is cross immunity between homologous spirochetes in blood from different stages of the disease.

7. Complete passive immunity has been conferred to mice with the serum from recovered mice.

8. Complete cross protection has been obtained between several California strains. Several of these are probably identical, and a very close relationship exists between others. The areas from which some of these strains had their origin are several hundred miles apart.

9. Three mice hyperimmunized to a California strain (LN) were protected against *Sp. novyi.* The possibility is recognized that there may be a very close serologic relationship between *Sp. novyi* and our California strains. From the history of *Sp. novyi* it is possible that this strain may have originated in Texas (Galveston ?), or some port in Mexico or Central America; and because of the probability that this strain and the California strain may have a common vector (*O. turicata*), particular attention is called to this result. This opinion is given further support by the findings of St. John and Bates[1] regarding the close relationship between *Sp. novyi* and the Panama strain.

10. The serum of a guinea-pig immunized against a Texas strain (Fall Creek) completely protected mice against large doses of the spirochetes of one California strain (162), and caused considerable delay in infection with two other California strains (LC and 334), of widely separated origins. It is highly probable that certain Texas and California strains may be closely related, if not identical.

11. From certain of my experiments it is believed that a more accurate technique, taking into account differences in virulence, should be employed in cross-immunity tests. Where such differences occur by a more careful management of the dosage, a relationship can be shown to exist between heterologous strains which, by grosser methods, would be considered to have only individual specificity.

12. Exhaustive tests with adult Sierra golden mantle ground squirrels (*Callospermophilus chrysodeirus, chrysodeirus* Merriam) showed that this species is probably immune from relapsing fever.

George Williams Hooper Foundation for Medical Research, Second and Parnassus avenues.

GEORGE E. COLEMAN,
San Francisco.

[3] Fleming and Allison: A Bacteriolytic Ferment Found Normally in Tissues and Secretions, Lancet, 1:218 (Feb. 2), 1929.

[4] Regnier: The Influence of the Concentration of Hydrogen Ions—Anesthetic Properties of Cocain, Bull. des Sciences Pharmacol., 31:513, 1924.

* A preliminary report.

[1] St. John, L. H., and Bates, L. B.: Am. J. Trop. Med., 2:251-266, 1922.

TULAREMIA

During recent years a number of cases of tularemia of the ulceroglandular type, with the initial lesions on the external genitalia, have been encountered.

The punched-out ulcer, the inguinal adenopathy and the macular rash that are sometimes seen in tularemia may simulate certain phases of syphilis to a striking degree. The duration of the ulcer is practically the same as in syphilis. The inguinal adenopathy is usually more marked in tularemia, and the rash, if it does appear, is earlier.

Practically all the individuals give a history of a tick-bite at the site of the lesion. Whether the tick actually transmits the disease, acts as a mechanical carrier or merely opens a portal of entry for a contact infection, is not entirely clear.

Repeated blood Wassermanns and agglutination tests for *B. tularense* should be made for at least one month.

Tularemia should be considered in the differential diagnosis of lesions of the external genitalia in individuals coming from an area where this disease is endemic.

GEORGE R. MAGEE,
Yerington, Nevada.

RETINAL DETACHMENT—DIATHERMY PUNCTURE AND COAGULATION

Retinal detachment, formerly regarded as a hopelessly incurable disease, is now yielding very hopeful results, due to the modern operative treatment presented to the ophthalmological world a few years ago by Gonin. As this treatment is still in its developmental stage, changes in technique are being rapidly worked out.

The original Gonin operation was puncture of the sclera with the Paquelin cautery. Several modifications of this were then developed. Recently a visit to the various European clinics, where most of this work is being done, showed that the original Gonin cautery puncture was being replaced by various newer operations. Of all these various procedures, the Safar multiple diathermy puncture operation seemed to be the best, as well as the simplest.

To help evaluate the various methods of operating, frequent case reports of results obtained with one particular type of operation are helpful. Therefore, the following report on sixteen cases operated upon according to the Safar multiple diathermy puncture method are offered. It is also hoped that this will help dispel the pessimism about the hopelessness of treatment of retinal detachment that still exists in some quarters.

Of the sixteen unselected cases operated upon, eight being in only eyes, six were successful, giving a percentage of 37.5 cured. These cases were absolutely unselected, no patient being turned away, no matter how hopeless the outlook.

This percentage is very gratifying when the cases are further separated into favorable and unfavorable. Favorable cases are those of short duration (a few weeks), with one or two small holes and with no complications, such as high myopia, vitreous opacities, cataract or intra-ocular operative procedures previously performed. Of these six favorable cases, three, or 50 per cent, were cured.

There were ten unfavorable cases, including two which had previously been unsuccessfully operated upon by the Gonin method. Of these ten patients, three (including the two just mentioned) were successfully operated upon, giving 33 per cent cured.

Thus, in a total of sixteen cases of detachment of the retina, six, or 37½ per cent, resulted in cures; a very gratifying figure, which should stimulate everyone to energetic treatment of this disease.

490 Post Street. DOHRMANN K. PISCHEL,
San Francisco.

Protein Fever Treatment in Neurosyphilis.—In the treatment of neurosyphilis as previously reported, Nelson gives for each paroxysm of fever two separate intravenous injections of combined typhoid vaccine instead of one. After administration of the first dose, which is of a size calculated to cause slight fever, two or three hours is allowed to elapse for the patient's temperature to reach its height, this point being determined by taking the temperature every twenty minutes. At the peak of the fever induced by the first dose, the second injection is given. Following the second dose, which seems to "explode" a physiologic charge created by the first, the patient's temperature usually rockets to the levels characteristic of malaria: 105, 106, or even 107 F. The author states that, by means of this method, fever consistently higher than that produced by ordinary methods is obtainable. Treatment by this method is less dangerous than by malaria, is more convenient and widely available, and at the same time probably makes use of bodily immunity reactions similar to those induced by malaria. Treatment of patients with resistant neurosyphilis by this method has been followed by improvement equal to that observed in similar cases treated by malaria.—*Southern Medical Journal.*

The Modern View of Preventive Medicine.—It is not unusual to hear preventive medicine discussed as if it is something apart, something altogether different from other branches of medical work. Yet surely most leaders of medical thought have long since discarded this idea, if indeed they ever had it. For many years now it has been an instruction of the General Medical Council (that important body in England which practically directs medical education throughout the Empire, that during his whole course of training the medical student shall have impressed on him the preventive aspect. The British Medical Association in England has taken the same view, and in formulating its proposals in 1930 for a general medical service made it "a fundamental principle . . . that a satisfactory system of medical service must be directed to the preventing of disease, no less than to the relieving of individual sufferers."

In his daily round the medical practitioner is the best public health worker we have. He aims not only to cure his patient, but to keep him in health. He aims to prevent the mild disorder from becoming a serious disease, to ward off dangerous complications.

The preventive and curative branch of medicine are not things apart. They are inseparably joined, an essential unity. The work at the bedside, indeed all efficient clinical work, is really an important part of preventive medicine. "To heal the individual sufferer, to enable him to resume his place in society, and to assist him to avoid recurrences of his trouble—these surely are our aims." The present high status of our community health is in large part due to the quiet unobstructive labors of general medical practitioners.—*Public Health Notes*, South Australia Department of Public Health.

STATE MEDICAL ASSOCIATIONS

This department contains official notices, reports of county society proceedings and other information having to do with the state associations and their component county societies. The copy for the department is edited by the state association secretaries, to whom communications for this department should be sent. Rosters of state association officers and committees and of component county societies and affiliated organizations, are printed in the directories noted under Miscellany, on the front cover index.

CALIFORNIA MEDICAL ASSOCIATION

GEORGE G. REINLE ..... President
CLARENCE G. TOLAND ..... President-Elect
EMMA W. POPE ..... Secretary-Treasurer

OFFICIAL NOTICES

Council Meeting.—The next meeting of the Council will be held in the offices of the Association, room 2004, 450 Sutter Street, San Francisco, on Saturday, January 20, 1934.

* * *

Application for Place on Annual Program.—Members who desire to present papers before the 1934 annual session, which will be held at Riverside, should write to the secretary of the section before which the particular subject should be presented.

Names and addresses of section officers are regularly published on advertising page 4 of each issue of CALIFORNIA AND WESTERN MEDICINE.

When requesting place on the program, a brief résumé of the paper should accompany the application.

* * *

Committee on Scientific Exhibits.—To stimulate greater interest in the scientific exhibit at the annual session, a special committee has been appointed by the Council: William J. Kerr, M. D., Lyell C. Kinney, M. D., Frederick Leet Reichert, M. D., Ernest M. Hall, M. D., and Elbridge Best, M. D., chairman.

* * *

Scientific Exhibits.—Those who are interested in planning a scientific exhibit at the Riverside meeting should apply for space to the Committee on Scientific Exhibits through the State Association office, room 2004, 450 Sutter Street, San Francisco, before the first of March, 1934.

In making application give title and description of exhibit with an estimated amount of floor and/or wall space required.

COMPONENT COUNTY MEDICAL SOCIETIES

CONTRA COSTA COUNTY

The November meeting of the Contra Costa County Medical Society, which was the annual business meeting, occurred on Tuesday evening, November 14, and was held as a dinner meeting at the Hotel Carquinez, Richmond.

The annual reports from the secretary-treasurer's office were read by Clara H. Spalding. Dr. Harry Ford moved that they be accepted, with a vote of thanks to Doctor Spalding. The motion was seconded by Doctor Carpenter, and passed by the society.

Reports of the committees, which have served during the current year most efficiently, were made as follows:

Committee on Public Relations—Dr. Harry Ford, chairman, who reported the plan recommended to the Board of County Supervisors.

Medical Economics—Dr. S. N. Weil, chairman.

Hospitals and Clinics—Dr. U. S. Abbott, chairman.

Health and Public Instruction—Doctor Fraser announced that several educational talks have been given by members to such organizations as the Parent-Teacher Associations. These undoubtedly help to disseminate medical information.

Membership—Dr. C. Spalding announced that six new names appear on the list of members since the beginning of the year. While several names of the members of the past year do not appear, for various reasons, the society has attained a net gain of one member.

History and Obituary—Fortunately, no need has arisen during the past year for the services of this committee.

Advisory to Woman's Auxiliary—Doctors Fraser, Abbott, and Weil reported activities of that very valuable body, and it was agreed they deserved a vote of thanks from the county society. Motion to that effect was made by Doctor Beard, seconded by Doctor Ford, and passed.

Under new business, suggestions and discussion followed, especially directed toward the activity of the Committee on Public Relations, which has given much time to the study of the mode of administering medical charity in the county. The plan drawn up by that committee, headed by Doctor Ford as chairman, ably assisted by Doctors U. S. Abbott, S. N. Weil, and McCullough and the officers of the society, as unofficial members of the committee, was discussed by Doctors Beard, Ford, Fraser, Walter Johnson, Daily, Dozier, Fitzgerald, and Carpenter. Among the suggestions tendered were:

1. A personal letter by every member of the society on his individual stationery, directed to the Board of County Supervisors, refusing further charity medicine unless the medical aspect be definitely removed from politics.

2. A specific demand upon the Board of Supervisors that they take some definite action upon the plan submitted to them about ninety days ago, and which they have never acknowledged.

3. Stress the fact that the plan submitted has the approval of the local society, the State Association, the College of American Surgeons, and the American Medical Association.

4. Publication of the plan that the general public may become informed of the details.

5. Newspaper publicity of the tremendous amount of medical charity being done in the county by private physicians, so that the public may become enlightened upon the subject.

6. That an ultimatum be issued to the Board of Supervisors, setting a time limit during which they shall be permitted to consider the proposed plan, beyond which the medical society shall proceed as they may see fit.

7. Offering again to meet in conference with the Board of Supervisors.

Accordingly, motion was made by Dr. Thomas Dozier, seconded by Doctor Carpenter, and unanimously passed by the members, that the present Committee on Public Relations, with a substitute for Doctor Beede, be authorized to proceed along any line that will best serve the wishes of the society, with full power to act as they think advisable.

Doctor Fraser named the committee, to consist of Doctors Harry Ford (chairman), U. S. Abbott, J. McCullough, S. N. Weil (secretary), and Thomas Dozier.

Doctor Ford requested a meeting at the office of Doctor Weil on the evening of November 16.

Doctor Fraser reported a meeting which he attended as a representative of the county medical society and which Dr. William Powell attended as a representative county officer, with the Pittsburg Health Center. The Pittsburg Health Center had arranged the meeting, asking advice as to how to proceed with their unit. Suggestion was made that they limit their activity to indigents, widen their scope, and that they would then be in a position to ask financial aid from the Board of Supervisors.

Dr. Kaho Daily, chairman of the Committee on Arrangements for the annual party, reported that it would be a dinner dance on December 16 at the Berkeley Country Club and that the price would be fixed at $2.50 per person. The members present agreed that the sum of $50 could be used from the county society treasury for that purpose. This is the amount that has been appropriated each year for several years past, but official sanction of the society has never before been given for this action.

Suggestions were made for increasing the size of the meeting and general pleasure afforded those who will attend by inviting the dentists and druggists to join with us. It was also suggested that a blanket invitation be sent by the secretary to the county societies of Napa, Solano, Alameda, San Joaquin, and San Francisco; those attending to come as pay guests.

The report of the Committee on Arrangements was accepted.

Dr. William Powell requested that the members of the profession be on the alert for cases of amebic dysentery, and warned them to report them promptly to the Health Department.

The subject of setting a fee schedule for Contra Costa County was discussed, deemed impracticable, and definitely shelved.

The Nominating Committee, Dr. S. N. Weil, chairman, suggested the following officers for the coming year: President, Dr. M. L. Stauffer of Pittsburg; vice-president, Dr. W. S. Lucas of Richmond; secretary-treasurer, Dr. Clara H. Spalding of Richmond. Censor for 1934-1936, Dr. Fred Nevius of Antioch. Delegate to the state convention, Dr. U. S. Abbott of Richmond. Alternate delegate, Dr. L. H. Fraser of Richmond.

No further suggestions being made, Dr. H. H. Carpenter moved that the secretary cast a unanimous ballot for the above-named officers. Motion was seconded and passed.

Doctor Weil suggested a rising vote of thanks for the excellent way in which Doctor Fraser, the president, has served the society in the past year, and Doctor Ford suggested the same courtesy to the secretary. After this gracious tribute, and a suggestion by Doctor Abbott for increasing the interest in the meetings for the coming year, and a suggestion by Doctor Ford for enhancing our membership, the meeting was adjourned at 10:10 o'clock by Doctor Fraser.

The attendance was the smallest of the year—fifteen—but those present agreed that the meeting around the dinner table had been most enjoyable.

CLARA H. SPALDING, *Secretary.*

ORANGE COUNTY

The Orange County Medical Society held its regular monthly meeting on November 7 at 8 p. m. in the Chapel of the Orange County Hospital. The meeting was unusually well attended, about seventy-five members being present.

Following the usual brief business session, Dr. C. D. Ball read the obituary of Dr. Frederick Pope.

Dr. Norman Kilbourne of Los Angeles, speaker of the evening, presented a paper on ***Hemorrhoids—Shall Treatment Be by Operation or Injection? Comparative Results in a Survey of Sixty Thousand Cases. Elimination of Pain in Rectal Operations, Methods of Injection.*** His talk indicated a vast amount of research and study, and his views were unprejudiced. The paper was well illustrated with lantern slides. A large number of questions were asked, and following this the meeting adjourned.

WALDO S. WEHRLY, *Secretary.*

SACRAMENTO COUNTY

A regular meeting of the Sacramento Society for Medical Improvement was held at the Elks Temple on September 19. The president, Dr. George Briggs, called the meeting to order at 8:30 p. m. Sixty-three members were present.

There were no case reports.

The first paper of the evening, ***Subarachnoid Hemorrhage,*** was read by Dr. Frank Reardon. The classification and etiology of this pathological condition was first discussed, then the symptoms of the various types of subarachnoid hemorrhage were outlined. The diagnosis of subarachnoid hemorrhage is often difficult. A case was reported which was first diagnosed as a brain tumor. The paper concluded with seven case reports, several of them with autopsy findings.

The second paper of the evening was the report of a case of ***Subarachnoid Hemorrhage*** by Dr. Fredrick Gundrum.

Appreciation of the papers was voiced by Doctors Young, Van Den Berg, Vance, Dozier, Howard, and Burden.

The application for membership of Dr. Walter N. Becker was read for the second time and voted upon. Doctor Becker was accepted unanimously into membership. The applications for membership of Doctors Anthony R. Boscoe, George O'Brien, and Edward A. Anderson were read for the first time. The transfer of Dr. Masa Atsu Harada was read for the first time.

Doctor Wilson gave a talk on the social service department at the Sacramento County Hospital. Doctor Wilson's speech was discussed by Dr. Frank Brendel. Moved by Doctor Gundrum and seconded by Doctor Scatena that this society express itself as willing to develop some method whereby the sick who cannot be admitted to the County Hospital, yet who cannot pay full rates, can be cared for. Carried.

Doctor Schoff suggested that an outline of the plan be mailed to all members of the society for their approval.

A letter was received from Doctor True suggesting a method whereby food handlers can be examined at reduced rates by physicians. Doctor Briggs appointed the following Food Handlers' Committee to study this problem and report at the next meeting: Doctors Dozier (chairman), Young, True, and Christman.

FRANK WARNE LEE, *Secretary.*

SAN BERNARDINO COUNTY

The November meeting of the San Bernardino County Medical Society was held at the County Hospital on Tuesday, November 7. The meeting was opened by the president, at 8:10 p. m.

Pursuant to the By-Laws, the proposed amendment published in the Bulletin was discussed. Dr. S. B. Richards suggested some changes, but no motion was carried making any.

Dr. V. Pinkley gave a short talk on certain phases of the management of the county charity hospital.

Announcement was made that the Riverside County Medical Society proposed to invite the San Bernardino County Medical Society to hear Dr. E. C. Rosenow of the Mayo Clinic, who will speak at Riverside, probably on December 20. Notice of the exact date will be given later.

The following paper was then presented: ***Agranulocytic Angina and the Malignant Neutropenia of Sepsis, with a Report of Four Cases.***

Doctor Garcelon being ill, this paper was read by Dr. George Landon. Discussion was opened by Doctor Neubert and continued by Doctor Harpham and others, and was closed by Doctor Landon.

The second part of the program was incomplete, as only one interesting clinical case was shown by the medical staff. The remaining time was filled in by Dr. Ivan Finkleberg, who showed motion pictures of the Century of Progress. E. J. EYTINGE, *Secretary.*

❋

SAN JOAQUIN COUNTY

The stated meeting of the San Joaquin County Medical Society was held in the Medico-Dental clubrooms, 242 North Sutter Street, Stockton, Thursday, November 2.

The meeting was called to order at 8:15 p. m., with Vice-President Gallegos in the chair.

The applications of Dr. Neill P. Johnson and Dr. T. E. Zinkan for membership in the San Joaquin County Medical Society were read and referred to the Committee on Admissions.

The nominations for officers for 1934 resulted as follows:

President—Percy B. Gallegos, J. M. Hench.

First Vice-President—H. J. Bolinger, A. R. Powers.

Second Vice-President—E. L. Blackmun, S. E. Latta.

Secretary-Treasurer—F. S. Marnell, G. H. Rohrbacher.

Board of Directors—N. P. Barbour, C. A. Broaddus, L. Dozier, J. F. Doughty, E. C. Griner, H. E. Kaplan, S. W. R. Langdon, R. T. McGurk, J. E. Nelson, B. J. Powell, Jr., D. R. Powell, G. H. Rohrbacher, G. H. Sanderson, T. L. Sutton.

Admissions Committee—C. A. Broaddus, F. J. Conzelmann, J. D. Dameron, L. Dozier, C. F. English, J. P. Hull, F. A. McGuire, H. C. Peterson, B. J. Powell, Jr., G. H. Rohrbacher.

Ethics Committee—J. E. Barnes, J. F. Doughty, E. C. Griner, R. T. McGurk, H. C. Peterson, B. H. Powell, Sr., D. R. Powell, G. H. Rohrbacher, M. H. Smyth.

Finance Committee—H. S. Chapman, J. V. Craviotto; J. D. Dameron, S. E. Latta, B. J. Powell, Sr., D. R. Powell.

Program Committee—William Friedberger, Samuel Hanson, B. J. Powell, Jr., G. H. Sanderson, Hudson Smythe, T. L. Sutton.

Delegates—P. B. Gallegos, H. E. Kaplan, D. R. Powell, G. H. Sanderson.

Alternates—C. A. Broaddus, J. F. Doughty, R. T. McGurk, C. V. Thompson.

There being no further business the scientific program was opened by Dr. Rodney A. Yoell of San Francisco with a paper on *Medical Economics.* The discussion took the form of questions led by Doctors Sanderson, Dewey Powell, Latta, and Griner.

Dr. Alson R. Kilgore was present among the guests, but had not prepared any message.

After some discussion of the cumbersome nomination and election rules of the By-Laws, it was moved by Dr. D. R. Powell that a committee be appointed to revise the procedure. This was duly seconded, and carried. C. A. BROADDUS, *Secretary.*

❋

SONOMA COUNTY

The regular monthly meeting of the Sonoma County Medical Society was held at the Occidental Hotel on October 9 at 7 p. m. In the absence of the president, Dr. S. S. Bogle occupied the chair.

The following guests and members were present: S. Z. Peoples, S. S. Bogle, Chesley Bush, C. J. Schmelz, Chester Marsh, C. M. Carlson, Ernest Nieira, C. B. Andrews, F. O. Butler, D. C. Oakleaf, Kathleen Morris, Herbert Honor, L. W. Hines, E. T. Noall, B. L. Baldwin, P. V. Konttas, W. C. Shipley, Irene Carlson of the California Tuberculosis Association.

Several communications were read and placed on file.

Preceding the evening meeting a clinic upon the subject of *Tuberculosis,* under the direction of Dr. Chesley Bush of the Alameda County Tuberculosis Hospital at Livermore, was held in the office of Doctors Shipley, Mahan, and Hines at 533 Mendocino Avenue, Santa Rosa, beginning at 2 p. m. Twenty-nine patients, from all parts of the county, were examined. Their x-ray, history records, and laboratory findings had all been prepared in advance. Seven of these patients were found to have active tuberculosis; eleven of them were considered suspicious, although no definite evidence of tuberculosis existed; and the remaining eleven patients were absolutely clear, having only slight respiratory or sinus infections, which accounted for their symptoms.

Those present were deeply interested in Doctor Bush's careful examinations of patients and interpretations of the roentgenograms. The afternoon was well and profitably spent.

Following the business meeting, Doctor Bush was again introduced and he delivered a very interesting talk on *Tuberculosis,* illustrated by lantern slides. It was a pleasure to listen to Doctor Bush, as he is evidently thoroughly conversant with his subject and able to impart his knowledge to his listeners.

Doctor Bogle thanked Doctor Bush for coming to the meeting, and expressed appreciation for the help given. A rising vote of thanks was then tended Doctor Bush.

The secretary announced that the December meeting would be the annual business meeting, report of officers, and election of officers for the ensuing year.

W. C. SHIPLEY, *Secretary.*

❋

VENTURA COUNTY

The monthly meeting of the Ventura County Medical Society was held in the Clinic Building of the Ventura County Hospital on October 10. The meeting was called to order at 8 p. m. by Dr. F. Royal Hendricks. Sixteen members and seven guests attended the meeting.

Doctor Ullmann of Santa Barbara, introduced as the speaker of the evening, gave a talk on the Alameda hospital plan. His talk was followed by a discussion by Doctors Henderson and Sheldon, members of the Public Relations Committee of Santa Barbara.

Following the program, communications were read.

The Public Relations Committee was instructed to write to Doctor Dickie for the hospital plan of the Alameda County Medical Association.

Dr. W. S. Clark moved and Dr. Bardill seconded the motion, that the Public Relations Committee act on the hospital plan. The motion was carried.

Dr. Thair Rich's application for transfer from Los Angeles County to Ventura County was read. It was moved, seconded and carried, that Doctor Rich be elected a member.

WILLIAM FELBERBAUM, *Secretary-Treasurer.*

CHANGES IN MEMBERSHIP

New Members (21)

Alameda County.—Donald Andrews Macfarlane, Frank E. Sawyer.

Contra Costa County.—Melvin Cooper Bolender, Claude Lamar Kerns.

Los Angeles County.—Robert V. Baker, Karel B. Blahnik, Florence May Dunlap, Edward Dorsey Ellis, E. Earll Kinzer, James J. O'Connor, M. W. Rosenberg, Carroll G. Simons, Albert James Supple, E. G. Louis Wiebusch.

San Diego County.—John Lee Farmer, Frederick F. Miller.

San Francisco County.—David Crise Cleave, Samuel R. Sherman, Charles Weiss.

Santa Clara County.—William E. Delphey, Hyman Tucker.

Transferred (3)

E. H. Benson, from Mendocino to Alameda County.

F. C. Ferry, from Orange to Los Angeles County.

Giuseppe Vercellini, from Fresno to Los Angeles County.

In Memoriam

Alexander, Ralph Lee. Died October 19, 1933, age 57. Graduate of University Medical College of Kansas City, 1903. Licensed in California in 1922. Doctor Alexander was a member of the Orange County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✠

Braafladt, Louis Henry. Died November 10, 1933, age 48. Graduate of Rush Medical College, 1916. Doctor Braafladt was a member of the Sacramento Society for Medical Improvement, the California Medical Association, and the American Medical Association.

✠

Bryant, Ernest Albert. Died October 19, 1933, age 64. Graduate of the University of Pennsylvania School of Medicine, 1890. Licensed in California in 1891. Doctor Bryant was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✠

Costar, William James, Jr. Died October 25, 1933, age 34. Graduate of the University of California Medical School in 1927, and licensed in California the same year. Doctor Costar was a member of the Butte County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✠

Edwards, William A. Died November 15, 1933, age 73. Graduate of the Pennsylvania School of Medicine, Philadelphia, 1881. Licensed in California in 1889. Doctor Edwards was an honorary member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✠

Gaynor, John Joseph. Died October 1, 1933, age 79. Graduate of the College of Physicians and Surgeons, 1881. Licensed in California in 1892. Doctor Gaynor was a member of the Santa Cruz County Medical Society, the California Medical Association, and the American Medical Association.

✠

Johnson, Carl. Died September 14, 1933, age 64. Graduate of the Denver College of Medicine, 1891. Licensed in California in 1912. Doctor Johnson was a member of the Los Angeles County Medical Association, the California Medical Association, and a Fellow of the American Medical Association.

✠

McElroy, Bernard F. Died November 7, 1933, age 61. Graduate of the University of California Medical School, 1899. Licensed in California in 1900. Doctor McElroy was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

✠

Oliver, Joseph A. Died October 17, 1933, age 71. Graduate of the University of California Medical School, San Francisco, 1889. Licensed in California in 1890. Doctor Oliver was a member of the San Francisco County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

Pope, Frederick Samuel. Died October 9, 1933, age 65. Graduate of the Medical Faculty of Trinity University, Toronto, 1898. Licensed in California the same year. Doctor Pope was a member of the Orange County Medical Society, the California Medical Association, and the American Medical Association.

✠

Talbot, William Thompson. Died November 9, 1933, age 52. Graduate of the College of Physicians and Surgeons, Los Angeles, 1918. Licensed in California the same year. Doctor Thompson was a member of the Imperial County Medical Society, the California Medical Association, and a Fellow of the American Medical Association.

OBITUARIES

Howard Augustus Gallup

1884-1933

By the sudden death of Dr. Howard Augustus Gallup from a coronary occlusion on October 9, the county of San Luis Obispo has lost one of its most valued physicians.

Doctor Gallup was born in Santa Clara on February 19, 1884. He was graduated from Cooper Medical College in 1911, and interned at the Santa Clara County Hospital. At El Segundo he practiced for two years, and at Arroyo Grande, San Luis Obispo County, four years. He moved to San Luis Obispo City in 1918, where he was associated with the late Doctor Stover. He acquired the San Luis Sanitarium in 1919, which he retained until his death.

Doctor Gallup was most active in civic affairs. As president of the local Chamber of Commerce, past president of the Rotary Club, and active worker in the cause of crippled children and member of the board of directors of the California Society for Crippled Children, he was a valued asset to the San Luis Obispo community. He was president of the San Luis Obispo County Fish and Game Association, and a director of the state organization; president, also, of the Guarantee Building and Loan Association of San Luis Obispo.

He was a member of the Benevolent and Protective Order of Elks, King David Lodge of Free and Accepted Masons, and a member of Al Malaikah Temple of the Shrine.

Doctor Gallup is survived by his widow, Maude Chase Gallup, and his son, Robert, nineteen years of age. A younger brother, Chester Gallup, resides in San Jose. A sister, Mrs. Eunice Anteureith, and his parents, Dr. and Mrs. T. E. Gallup, reside in Yreka.

ALLEN F. GILLIHAN.

Frederick Pope

1863-1933

Frederick S. Pope of Santa Ana died October 19, after a brief illness from cerebral hemorrhage, in St. Joseph Hospital, Orange. Although he had been a member of the Orange County Medical Association for only a few years, he had formed many friendships among the members and was much respected.

Doctor Pope was born in Cornwall, England, of English parentage, May 16, 1863. His parents were William Pope and Elizabeth Chenoweth Pope.

His preliminary education was had at English public schools, including the Plymouth Grammar School. In 1893 he married Elizabeth S. Stafford. Having removed to Canada, Doctor Pope studied medicine, and was graduated from Trinity University, Toronto, M. D. 1898. His California license was granted shortly thereafter.

For a while Doctor Pope practiced in Alberta, Canada, but kept in close touch with the land of his nativity. He received his M. R. C. S., England, in 1902, and the following year his L. R. C. P., London.

During the Great War he served for a time in the Royal Army Medical Corps, Fort Recasla, Malta.

In 1924 Dr. and Mrs. Pope located in Orange County, where Doctor Pope remained in active practice until his death. The doctor was an Episcopalian in church affiliation, and Republican in politics.

The sympathy of the members of the Orange County Medical Association is extended to Mrs. Pope in the loss of her husband.

C. M. A. DEPARTMENT OF PUBLIC RELATIONS*

Legislation Provides Reimbursement to Some Hospitals for Services to Indigents Injured in Automobile Accidents

Between $250,000 and $300,000 in state funds will be available during the next twelve months for distribution to some hospitals of the state as reimbursement for expenses incurred by such institutions for the care of indigent persons injured in motor-vehicle accidents, in accordance with the terms of legislation (House Bill No. 80), enacted by the ninetieth Ohio General Assembly, and which became effective October 9.

Only Ohio hospitals "organized and operated not for profit" will benefit under the Act, which was sponsored and promoted by the Ohio Hospital Association and introduced in the legislature by Representative S. A. Hesse, Cleveland. A considerable number of privately owned hospitals and institutions will be excluded from participation in the fund because of the "nonprofit" requirement of the Act.

The measure had a stormy career in the legislature and was not enacted until the closing moments of the session because of objections raised by some members of the General Assembly. At that time it was pointed out by some legislators that the Act discriminated between hospitals and that it provided for the use of a specific state fund designated for other purposes. Moreover, doubt was raised as to the fundamental policy of compensation for one particular type of injuries and as to the soundness of the policy of having the state finance such activities which are not strictly emergency poor relief activities.

To save the bill from defeat its backers consented to an amendment which limits its operation and effect until March 1, 1935.

Under the Act each hospital able to qualify under the terms of the Act will be entitled to reimbursement from the State Maintenance and Repair Fund, raised by the annual automobile license-tag fees, for the care of persons injured in motor-vehicle accidents who are unable to pay for hospitalization.

The sum to be taken from the Maintenance and Repair Fund for reimbursement to hospitals is allotted by setting aside 19 cents for each motor vehicle registered in the state for the years 1933, 1934, and 1935 prior to March 1, 1935.

Hospitals permitted to share in the fund will be paid on a *per diem* basis for the hospitalization of indigent victims of motor-vehicle accidents. The *per diem* rate is to be the same as the *per diem* amount paid to each hospital by the State Industrial Commission.

As defined in the Act, an "indigent person is one who has suffered a motor-vehicle injury, is received and cared for in a hospital, is unable to pay for the cost of such care and whose account, therefore, remains unpaid at the expiration of ninety days after the termination of such care."

The Act excludes an employee suffering from a motor-vehicle injury with respect to which he is entitled to the benefits of the Workmen's Compensation Act. A person injured by the operation of a motor vehicle is deemed unable to pay hospital charges if it appears that, should an action be brought and judgment secured for the payment of the hospital bill against him or against any other person legally responsible for his care, execution thereon is unavailing.

The State Registrar of Motor Vehicles is charged with administration of the Act and with approval and payment of claims filed by hospitals. Hospitals entitled to the benefits of the Act and desiring to take advantage of it are required to make, monthly, detailed reports to the registrar, setting forth all the facts in the case for which payment is requested. If the registrar of motor vehicles disapproves any claim, the claimant hospital is entitled to a hearing before him to press its claim. The decision of the registrar in all claims is final.

In case a patient for whom a hospital has been reimbursed by the registrar should become able to pay for his hospitalization, the hospital is expected to collect from him the amount of his hospital bill. Should the amount of the bill be collected, the registrar of motor vehicles is authorized to deduct such amount from future claims submitted by the hospital. In event reimbursement to the state cannot be collected in this manner, the Act authorizes suit against the hospital by the Attorney-General.—*Ohio State Journal*, November, 1933.

* * *

Court Ruling on Fee Splitting

Considerable publicity has been given to a novel case recently decided in the Surrogate's Court of New York County, New York, in which the division of fees by physicians was involved. The case arose from a provision in the will of the late Henry Sterne which established trusts for the benefit of the Montefiore Hospital and the Hospital for Joint Diseases, New York City, but provided that, to become eligible, the two institutions must "make a binding rule to the effect that any and all physicians at any time practicing for remuneration in the said respective institutions shall be required to and shall pay toward the maintenance and support of the said institution a sum of money equal to 10 per cent of the gross fees which shall at any time be received by such physicians, respectively, for services performed by them in the said institutions."

A protest against this provision of the will was filed in the Surrogate's Court by the two hospitals, the petition stating that the condition imposed upon them a rule of conduct which was in violation of public policy, compelled the division of fees by physicians and would impair the efficiency of the hospital.

* An open forum for progress notes on the department's activities, and for brief discussions on medical economics. Correspondence and suggestions invited. Address Walter M. Dickie, Room 2039, Four Fifty Sutter Street, San Francisco. This column is conducted by the Director of the Department.

In deciding the case in favor of the hospitals and striking the provision from the will, the court declared:

"It is immaterial whether the division of medical fees occurs between a physician or a layman, or a physician and a physician in cases prohibited by the canons of ethics, or, as in the situation here, between a physician and a hospital. Inevitably such a method of division would lead to deterioration in the medical staffs of hospitals with attendant injury to the public. It would likewise subject some physicians to the temptation of overcharging their patients to meet the requirements of the hospital rule.

"Although the difficulty in enforcing the condition might not of itself be a ground for a determination of invalidity, where, as here, it is mingled with a requirement that is unreasonable, unethical, and in violation of public policy, the court cannot sustain it."

This attitude of the New York court is encouraging. It is possible it may blaze the trail for similar settlements of bad situations elsewhere, where division of fees is not necessarily involved, but where commercialized ventures in supplying medical services are flourishing.

It may become necessary for those familiar with the dangers of many medical and hospital service schemes to turn to the court to protect the public. It is easy to imagine the short work which could be made of some medical rackets were the projects taken to court for judgment on their merits in the light of public policy and public benefits.—*Ohio State Medical Journal*, November, 1933.

THE WOMAN'S AUXILIARY TO THE CALIFORNIA MEDICAL ASSOCIATION*

Component County Auxiliaries

Alameda County.—Last year the members of the Woman's Auxiliary to the Alameda County Medical Association started something. They invited their husbands to a party. Quite evidently the husbands liked it, for this year, when they were asked to a dinner party on October 20, they all wanted to come. The large dining-hall of the Women's Athletic Club was well filled.

Mrs. Charles E. Dukes, president of the auxiliary, spoke a few cordial words of welcome and introduced the guests of honor, Dr. George Reinle, president of the State Medical Association, and Mrs. Reinle, whose presence added greatly to the importance and pleasure of the occasion.

Unfortunately, Dr. Dexter Richards, president of the County Medical Association, was unable to attend, and Mrs. Richards had to endure the evening as a widow. Dr. Frank Baxter, president-elect of that organization, made himself famous as the author of a speech, which might be called *The Exploitation of Madame X.*

A series of clever dramatic readings was presented by Miss Dorothy Crawford, of national broadcasting fame. Mrs. William H. Sargent led the whole group in singing some medical renditions of old songs with most entertaining results. Many guests remained for cards later in the evening.

Undeniably the party was a complete success. There is no question about that. But there are rumors of a question. Has anyone been asked, "Who gave that party?"

Los Angeles County.—The regular meeting of the Woman's Auxiliary to the Los Angeles County Medical Association was held October 17 at the Ebell Club Solarium, with Mrs. A. Bennett Cooke presiding. Luncheon was served at 12:30, followed by a short business meeting.

The program was given by Dr. E. S. Remmen, who spoke on *Changing Conditions in Medical Practice.* Dr. Harry Wilson spoke on *How Shall These Changing Conditions Be Met,* comparing many of the old methods of care, still used by the uninformed, to the new.

Current Events—*The New County Hospital* was given by Mr. O. W. Olsen, assistant superintendent of the Los Angeles County Hospital.

* * *

Sacramento County.—The regular meeting of the Woman's Auxiliary to the Sacramento Society for Medical Improvement was held on Tuesday evening, October 17, at the home of Mrs. J. B. Harris. About seventy members and guests were present. A short business meeting was held, with the president, Mrs. F. N. Scatena, presiding. It was voted to give $10 to the Community Chest, $10 to the Sacramento Orphanage, and $5 to the "Little House," a home for girls who are too old for the orphanage and too young for the Y. W. C. A. Two new members were announced: Mrs. Joseph L. Mullen of Sacramento and Mrs. L. B. Barnes of Newcastle. Mrs. George Foster was named chairman of the Nominating Committee, and Mrs. H. J. Davis was nominated from the floor, Mrs. Foster from the executive board, the third member to be selected by the two named. The announcement was made that the next meeting would be held on the third Tuesday of November at the home of Mrs. Burt Howard and no cards will be sent out.

After the business meeting, musical selections were given by Mrs. George Iki, accompanied by Mrs. Eugene Pitts, and by Mrs. Herman Lehne, accompanied by Mrs. George Popert. Miss Cornelia Provines, Sacramento County Librarian, reviewed three books in a most entertaining manner.

The program was followed by a social hour, and refreshments were served by the hostess, assisted by Mesdames J. Roy Jones, George Iki, Nathan Hale, and Bert Thomas. Everyone present declared it was one of the most successful and enjoyable meetings the auxiliary has ever held.

On Monday, October 23, our president, Mrs. Scatena, left for Chicago to be present on October 30 at the all-day meeting of the Chairmen of the National Women's Crusade, called by Mrs. Franklin Roosevelt. As auxiliary president here, Mrs. Scatena was named chairman in this district and sponsored the meeting at which Dr. Aurelia Henry Reinhardt spoke here in Sacramento. At the meeting in Chicago of the National Women's Committee, the speakers will be Mrs. Roosevelt, Mr. Newton Baker, and Miss Jane Addams.

(Mrs.) F. P. Brendel,
Corresponding Secretary.

* * *

San Diego County.—The Woman's Auxiliary to the San Diego County Medical Society met on October 10. The members present regretted that the president, Mrs. Charles E. Howard, could not be with us on account of illness.

The Nominating Committee, to report a slate of officers at the November meeting, was appointed. A proposed amendment including the words "adult granddaughters" in the membership, making our local constitution correspond with the state's, was read. A formal vote favoring the adoption of a project cooperating with the Crippled Children's Society of San Diego in its work with infantile paralysis was made.

Interesting bits of current events were given by one member, and the book "Devils, Drugs, and Doctors" was delightfully reviewed by another member, as the main part of the program.

(Mrs.) Harriet L. Colby, *Secretary.*

* As county auxiliaries to the Woman's Auxiliary to the California Medical Association are formed, the names of their officers should be forwarded to Mrs. Thomas J. Clark, chairman of the Publicity and Publications Committee, 40 Ross Circle, Oakland. Brief reports of county auxiliary meetings will be welcomed by Mrs. Clark and must be sent to her before publication takes place in this column. For lists of state and county officers, see advertising page 6. The Council of the California Medical Association has instructed the editor to allocate one page in every issue for Woman's Auxiliary notes.

Santa Barbara County.—Twenty-one members and guests were entertained by the new president of the Woman's Auxiliary to the Santa Barbara County Medical Society, Mrs. John Van Paing, at her home 1334 Alameda Padre Serra on Friday afternoon, October 20.

There were tables of bridge, followed by a short business session, Mrs. Van Paing presiding. The minutes of the last meeting were read and approved. Mrs. Wilcox reported placing a subscription to *Hygeia* with the library of the new recreation rooms, as a gift from the auxiliary. A letter of resignation from Mrs. Atsatt was read. Mrs. Stevens moved to accept Mrs. Atsatt's resignation and to have the secretary write her a letter expressing our sincere regrets in so doing. Mrs. Friedell seconded the motion.

The president requested those present to offer suggestions for a benefit, to take place in the near future, whereby we may secure funds for our nurses' awards. Mrs. Van Paing named Mesdames Wilcox, Profant, and Hambach as a committee to arrange a card party.

After the meeting adjourned, a very lovely tea was served by the hostess, with Mrs. Brown and Mrs. Bakewell presiding.

MABEL HUNT, *Secretary.*

Proposed Amendments to the Constitution of the Woman's Auxiliary to the California Medical Association*

ARTICLE III

Members

Section 1. Change to read:

(a) *The membership of this Auxiliary shall consist of women members—active, associate, and honorary.*

(b) *Active membership shall consist of women members in good standing in the component county auxiliaries.*

(c) *Associate membership shall consist of women who are wives of interns, wives of members of the United States Army and Navy Medical Corps.*

(d) *Honorary membership may be conferred only by the Board upon those women to whom a particular tribute is deemed desirable.*

Add:

Section 2. (b) *Women otherwise eligible to membership whose husbands practice any art of healing not recognized by the medical profession, shall forfeit all membership privilege.*

ARTICLE V

Board of Directors

Section 1. Insert after the word "Constitution" on second line, *together with the chairmen of standing committees.*

Section 3. Add as paragraph (c) under this section:

All County Presidents shall be eligible to attend Board meetings and shall receive written notices of same. They shall have voice but no vote in the proceedings.

---

* Article from present Constitution covering amendments.

ARTICLE XV

Amendments

This Constitution may be amended at any regular annual meeting of this Auxiliary by a two-thirds vote of the members of the House of Delegates present and voting, provided a copy of the proposed amendment shall have been mailed to each member of the Board of Directors and to the Secretary of each county auxiliary at least sixty (60) days prior to the date of said meeting; and provided further that said amendment shall have been published at least once in CALIFORNIA AND WESTERN MEDICINE at least three months prior to the adoption thereof; and provided, finally, that such amendment shall, prior to adoption thereof, have been approved by the Council of the California Medical Association evidenced by resolution thereof.

ARTICLE VII

Duties of Officers

Section 2. Add to end of this paragraph:

It shall be her duty to encourage active organization of County Auxiliaries throughout the State.

Section 3. Change the word "Program" to *Health Education.* And add to this section: *It shall be her duty to outline suggested programs and to assist County Program Chairmen in developing programs suited to their needs.*

Section 4. Change to read:

The Recording Secretary shall record the minutes of all meetings and shall perform such other duties as are *outlined in the Handbook.*

Section 5. Add to this section:

She shall present at the annual meeting a report duly audited by a professional accountant.

Section 6. Add as paragraph:

(b) *The Corresponding Secretary shall be Chairman of Credentials and Registration.*

Add as paragraph:

(c) *It shall be the duty of the Corresponding Secretary to send to the National President, immediately following the annual meeting, twelve copies of the list of newly elected officers and members of the State Board.*

Add as:

Section 9. *All duties of all officers as outlined herein shall be amplified according to "Duties of Officers" in Handbook for State Auxiliaries.*

ARTICLE VIII

Standing Committees

Section 1. Change to read:

The Auxiliary shall carry on its major activities through the following Standing Committees, *the Chairmen of which (unless otherwise provided for in the Constitution) shall be appointed by the President.*

Membership and Organization
Health Education
Finance
Public Relations
Public Health Activities
Editor and Publicity
Hygeia
Convention

Section 2. Change to read:

Each Standing Committee shall consist of at least three members, the Chairman of which shall be a member of the Board of Directors, *the other members to be appointed by the President and Chairman, and ratified by the Board.*

Section 3. Change to read:

(a) *The duties of the Committee on Membership and Organization shall be as outlined in Article VII, Section 2.*

(b) *The duties of the Committee on Health Education shall be as outlined in Article VII, Section 3.*

(c) *The Finance Committee shall consist of three members, the Chairman (appointed by the President), the Treasurer, and the retiring Treasurer. This committee shall prepare the annual budget and present same to the Board for its approval at the pre-convention meeting, before final submission to the House of Delegates.*

(d) *The Committee on Public Relations shall be the liaison between the Auxiliary and all other organizations. This committee shall foster and encourage all matters looking to the advancement of medical science.*

(e) *The Committee on Public Health Activities shall seek information concerning all Public Health Activities with a view toward coöperating in the promotion of acceptable health measures.*

(f) *Editor and Publicity: It shall be the duty of this committee to edit the Auxiliary department in "California and Western Medicine," and to file all suitable material for the Archives. This committee shall prepare all public notices and articles for the press and shall send duplicate*

copies of all outstanding items of interest to the National Publicity Chairman. This committee shall be the custodian of the State Scrap Book and shall prepare all State and National exhibits of same.

(g) *The Hygeia Committee shall be responsible for subscriptions to "Hygeia" magazine, and shall coöperate in the program outlined by the National "Hygeia" Chairman.*

(h) *The Convention Committee shall be responsible for the details of convention entertainment and program, and shall work in conjunction with the President in all plans. This committee shall prepare and present for approval at the February meeting of the Board a tentative program for the annual meeting. This committee shall also be responsible for all pre-convention publicity.*

ARTICLE IX

Nominations and Elections

Section 3. Add as paragraph:

(b) *If, through lack of proper representation of a district at the annual meeting there is a vacancy in the councilorship, this vacancy shall be filled by the Board at its first meeting.*

Add as paragraph:

(c) *When only one delegate is present to represent a district, she shall be nominated District Councilor.*

ARTICLE X

Delegates

Section 4. Change to read:

The Board of Directors of each County Auxiliary shall elect its delegates and alternates, *and forward list of same to State Treasurer.* Each County Auxiliary secretary shall *distribute the proper credential cards which shall have been issued by the State Corresponding Secretary,* to both delegates and alternates, *and shall return the duplicates, properly signed,* to the State Corresponding Secretary.

Add as

Section 5. *Vacancies occurring in any county delegation may be filled by the chairman of said delegation.*

Section 5, as it now stands, to be known as Section 6.

Section 6, as it now stands, to be known as Section 7.

ARTICLE XI

Meetings

Insert as

Section 4. *The registration fee for members at the annual meeting shall be one dollar each member.*

Section 4. This section as it now stands, to be known as Section 5.

ARTICLE XII

Dues

Section 3. Omit.

ARTICLE XIII

County Auxiliaries

Section 3. Change to read:

The wives and mothers, adult sisters, adult daughters *and adult granddaughters,* and the widows of members in good standing of a county medical society (active, associate or honorary) only shall be eligible to membership in the county auxiliary. Women having the degree of M. D. or a degree for any art of healing, or whose husbands practice any art of healing not recognized by the State Medical Association, shall be ineligible to membership.

Section 8. (b) Change to read:

The fiscal year of all county auxiliaries shall correspond *to the calendar year.*

Section 9. Change to read:

Names of all delegates and alternates shall be filed in the office of the *Treasurer* of the State Auxiliary *thirty* days prior to the annual meeting. *The name of the chairman of the delegation shall be indicated.*

Section 11. Add as paragraph:

(b) *Immediately following each annual election, the Corresponding Secretary shall forward two copies of the list of newly elected officers to the State President.*

NEVADA STATE MEDICAL ASSOCIATION

D. A. SMITH, Mina ..... President
E. E. HAMER, Carson City ..... President-Elect
J. N. VAN METER, Las Vegas ..... First Vice-President
W. H. FROLICH, East Ely ..... Second Vice-President
HORACE J. BROWN, Reno ..... Secretary-Treasurer

COMPONENT COUNTY MEDICAL SOCIETIES

CLARK COUNTY

On November 14 the Clark County Medical Society was entertained by Dr. R. O. Scofield, with dinner at the Boulder City Hospital, and who then presented a series of fracture cases then under treatment.

Fractures of the humerus and scapula, accompanied by dislocation of the humerus; compound comminuted fractures of the leg; fractures of the os calcis and fractures of the metacarpals, to a total of about forty cases, were presented and discussed.

Dr. F. M. Ferguson gave a short talk on Doctor Hertzler and his work at the Halstead Hospital.

J. N. Van Meter, *Secretary.*

WASHOE COUNTY

The Washoe County Medical Society held its regular monthly meeting in the State Building, Tuesday evening, November 14, Dr. Da Costa presiding.

The society moved to reverse the usual order of proceedings by calling upon Dr. F. M. Pottenger of Monrovia, California. Doctor Pottenger came to Reno under the direction of the California Tuberculosis Association, and was sponsored by the Nevada Public Health Association and the Washoe County Medical Society. The subject of Doctor Pottenger's address was a general review of the treatment of tuberculosis for the past sixty years. The foundation for scientific treatment really did not begin till the discovery of the tubercle bacillus by Robert Koch in 1882. Since the cause of the disease was known, the attention of the medical profession has been directed as much to the prevention of the disease as toward its cure. Organized scientific effort has not only materially lessened the death rate, but provided a much more hopeful outlook for the tuberculous patient. Today the outlook for the tuberculous patient, coupled with hygienic surroundings, becomes the great hope for both patient and profession. The public health slogan should be early recognition of the disease. This should consist in well-organized clinics where every school child should be regularly examined by all the diagnostic means at the command of the profession.

The whole field of mental and physical therapeutics was so thoroughly covered by the speaker that the audience could have listened as long as he would care to talk. So we say, appreciatively, "Come again, Doctor Pottenger."

The society then resumed its routine work and upon conclusion adjourned.

Thomas W. Bath, *Secretary.*

The great characteristic of any living thing, the final distinction between a living thing and a dead thing, is the ability which the living thing has to adjust itself to its surroundings. For instance, a dead thing, a stone or a corpse, in the Arctic becomes chilled clear through; in the tropics becomes heated clear through; it is at the mercy of its surroundings. But a living man shows an unchanged internal temperature, whether he be exposed to Arctic or tropic, summer or winter, so long as he is alive and well—*i. e.,* so long as he can adjust himself to his surroundings. That is what "alive and well" means. Health is "successful adjustment, without pain or damage."—H. W. Hill, M. D.

MISCELLANY

Under this department are ordinarily grouped: News; Medical Economics; Correspondence; Twenty-five Years Ago column; Department of Public Health; California Board of Medical Examiners; and other columns as occasion may warrant. Items for the News column must be furnished by the fifteenth of the preceding month. For Book Reviews, see index on the front cover, under Miscellany.

NEWS

Coming Meetings.

American Medical Association, Cleveland, Ohio, June 11 to 15, 1934. Olin West, M. D., Secretary, 535 North Dearborn Street, Chicago, Illinois.

California Medical Association, Riverside, April 30 to May 3, 1934. Emma W. Pope, M. D., Secretary, 2004 Four Fifty Sutter, San Francisco.

Southwestern Medical and Surgical Association, El Paso, Texas, December 7 to 9, 1933. John L. Murphy, M. D., Member Committee on Publicity, 404 Robert Banner Building, El Paso, Texas.

Western Surgical Association, Cincinnati, December 8 to 9, 1933. Frank R. Teachenor, M. D., Secretary, 306 East Twelfth Street, Kansas City, Missouri.

Medical Broadcasts.*

American Medical Association Health Talks.—The American Medical Association broadcasts on Tuesdays and Thursdays from 8:55 to 9 a. m., Central Standard Time, over Station WBBM (770 kilocycles, or 389.4 meters).

There is also a fifteen-minute talk, sponsored by the Association, on Saturday mornings from 9:45 to 10 o'clock, Central Standard Time, over Station WBBM.

* * *

San Francisco County Medical Society.—The San Francisco County Medical Society broadcast program for the month of December is as follows:

Tuesday, December 5—KJBS, 11:15 a. m., and KFRC, 1:35 p. m. Subject: What You Should Know About Tuberculosis.

Tuesday, December 12—KJBS, 11:15 a. m., and KFRC, 1:35 p. m. Subject: Questions and Answers About Tuberculosis.

Tuesday, December 19—KJBS, 11:15 a. m., and KFRC, 1:35 p. m. Subject: How Collapsing the Lung Cures Patients of Tuberculosis.

Tuesday, December 26—KJBS, 11:15 a. m., and KFRC, 1:35 p. m. Subject: The Humanity of Vivisection.

* * *

Los Angeles County Medical Association.—The radio broadcast program for the Los Angeles County Medical Association for the month of December is as follows:

Tuesday, December 5—KECA, 9:30 a. m. Subject: That Tired Feeling.

Friday, December 8—KFAC, 9:15 a. m. Subject: Your Doctor and You.

Saturday, December 9—KFI, 9:15 a. m. Subject: That Tired Feeling.

Tuesday, December 12—KECA, 9:30 a. m. Subject: The Child's Appetite.

Friday, December 15—KFAC, 9:15 a. m. Subject: Your Doctor and You.

Saturday, December 16—KFI, 9:15 a. m. Subject: The Child's Appetite.

Tuesday, December 19—KECA, 9:30 a. m. Subject: Children's Nutrition.

Friday, December 22—KFAC, 9:15 a. m. Subject: Your Doctor and You.

Saturday, December 23—KFI, 9:15 a. m. Subject: Children's Nutrition.

Tuesday, December 26—KECA, 9:30 a. m. Subject: Modern Miracles.

Friday, December 29—KFAC, 9:15 a. m. Subject: Your Doctor and You.

Saturday, December 30—KFI, 9:15 a. m. Subject: Modern Miracles.

* County societies giving medical broadcasts are requested to send information as soon as arranged (giving station, day, date and hour, and subject) to CALIFORNIA AND WESTERN MEDICINE, 450 Sutter Street, San Francisco, for inclusion in this column.

Herzstein Lectures.—Stanford University and the University of California take pleasure in announcing the fourth course of the Morris Herzstein Lectures to be given by Herbert M. Evans, M. D., professor of anatomy, and Morris Herzstein, professor of biology and director of the Institute of Experimental Biology of the University of California. Under the provisions of the will of the late Dr. Morris Herzstein of San Francisco, these lectures are held in San Francisco under the auspices of the two universities.

Doctor Evans will speak on "The Internal Secretions of the Anterior Lobe of the Pituitary Body," and his lectures will be illustrated. They will be held at the San Francisco County Medical Society, 2180 Washington Street, San Francisco, on the following dates: Monday, January 29, 8:15 p. m.; Wednesday, January 31, 8:15 p. m.; and Friday, February 2, 8:15 p. m.

Members of the medical profession, including practitioners and medical students and other interested persons are cordially invited to attend. The lectures are open to the public as well as to the medical profession.

Los Angeles County Heart Association.—Clinical lectures were given on Thursday evening, December 7, and Friday morning and afternoon, December 8.

The Thursday evening lecture was a joint meeting with the Los Angeles County Medical Association.

The topics discussed were as follows:

The Importance of an Etiological Diagnosis in Heart Disease. By E. Richmond Ware, M. D., Los Angeles.

The Mechanism of the Heart Beat and Electrocardiography (moving picture). By R. Manning Clarke, M. D., Los Angeles.

The Use of Tissue Extracts in Angina Pectoris and Spastic Arterial Disease. By Franklin R. Nuzum, M. D., Santa Barbara.

Some Observations on Congenital Heart Disease. By Phillip E. Rothman, M. D., Los Angeles.

The Adolescent Heart. By Henry H. Lissner, M.D., Los Angeles.

The Determination of Arrhythmias Without Instrumental Aid (Methods?). By Donald J. Frick, M. D., Los Angeles.

Syphilitic Heart Disease. By Burrell O. Raulston, M. D., Los Angeles.

Heart Bogies. By John C. Ruddock, M. D., Los Angeles.

The Heart in Diabetes. By Howard F. West, M. D., Los Angeles.

The Failing Heart of Middle Life. By Robert W. Langley, M. D., Los Angeles.

Subacute Bacterial Endocarditis. By William H. Leake, M. D., Los Angeles.

The Heart in Hypertensive Disease. By Arthur Stanley Granger, M. D., Los Angeles.

Southwestern Medical and Surgical Association.—The Southwestern Medical and Surgical Association held its annual meeting at El Paso, Texas, December 7, 8, and 9. The first day was entirely devoted to allergy, the second to tuberculosis, and the third to goiter.

American Association for the Study of Goiter.—The American Association for the Study of Goiter, for the fifth time, offers $300 as a first award, and two honorable mentions for the best essays based upon original research work on any phase of goiter presented at their annual meeting in Cleveland, Ohio, June 7, 8, and 9, 1934. It is hoped this will stimulate valuable research work, especially in regard to the basic cause of goiter.

Competing manuscripts must be in English, and submitted to the corresponding secretary, J. R. Yung, M. D., 670 Cherry Street, Terre Haute, Indiana, not later than April 1, 1934. Manuscripts received after this date will be held for the next year or returned at the author's request.

The first award of the Memphis, Tennessee, 1933 meeting was given Anne B. Heyman, A. B., M. S., University of Michigan, Ann Arbor, Michigan, "The Bacteriology of Goiter and the Production of Thyroid Hyperplasia in Rabbits on a Special Diet."

Honorable mentions were awarded J. Lerman, M.D., and W. T. Salter, M. D., Huntington Memorial Hospital, Boston, Massachusetts, "The Calorigenic Action of Thyroid and Some of Its Active Constituents." Prof. Dr. Stefan Konsuloff, Sofia, Bulgaria, "Experimental Studies on Etiology of Goiter."

American Medical Association Scientific Exhibit at Cleveland.—Application blanks are now available for space in the scientific exhibit at the Cleveland session of the American Medical Association, June 11 to 15, 1934. The Committee on Scientific Exhibit requires that all applicants fill out the regular application form, and requests that this be done as early as convenient. The final date for filing applications is February 26, 1934. Persons desiring to receive application blanks should address a request to the Director, Scientific Exhibit, American Medical Association, 535 North Dearborn Street, Chicago, Illinois.

The First Course in Race Hygiene.—In August the first course in race hygiene for physicians was organized at the University of Halle. More than five hundred physicians, about one-third of all the physicians in that area, are taking the course. At the end of one or two years, the government medical commissar has announced, all physicians of Germany will be required to furnish evidence that they have taken such a course. In Saxony a law to that effect has already been enacted; Prussia and the remaining German *länder* will soon follow. Privatdozent Kürten, the director of the course, called attention in his introductory lecture to the trail blazed by America in the field of race hygiene. Measures that scientists of all countries have long since demanded but that have never been carried out, Germany will now make a reality. The course as organized consists of: introduction to ethnology, theory of hereditary transmission in man, race hygiene and the recent legislative enactments in Germany in this field.—*Journal of the American Medical Association,* Vol. 101, No. 12.

CORRESPONDENCE

Subject of following letter: A communication from the California Director of Public Health on the retirement of President John H. Graves from the California State Board of Health.

To the Editor:—At the meeting of the California State Board of Health held at San Francisco on November 4, 1933, Dr. John H. Graves, who had submitted his resignation as a member of the State Board of Health to Governor James Rolph, introduced his successor, Dr. Hubert Morrow of the University of California. After Doctor Morrow had been inducted into office as a member, the Board elected Doctor Morrow president.

The attached resolutions were passed by a standing vote of the members to express their appreciation of the services rendered by Doctor Graves as president of the California State Board of Health during the last eighteen months.

Very truly,

GILES S. PORTER, *Director.*

* * *

RESOLUTIONS

WHEREAS, Because of other official and professional responsibilities, Dr. John H. Graves of San Francisco has seen fit to submit his resignation as a member of the Board of Public Health of the State of California to his Excellency, Governor James Rolph, Jr.; and

WHEREAS, During his term of service as a member and as president of the State Board of Public Health, he has given faithful and most efficient service to the state, and has been responsible for constructive changes in administration that should work in large measure to the best interests of the public health; now, therefore, be it

Resolved, That the Board of Public Health of the State of California, in regular session assembled at San Francisco on November 4, 1933, herewith expresses the appreciation of its members, individually and collectively, of the services which have been rendered by Dr. John H. Graves, for the excellent manner in which he has presided at the Board meetings, and for his efficient and loyal supervision of the administration of the policies and actions of this Board; and be it further

Resolved, That these resolutions be placed in the minutes, that a copy be printed in the "Bulletin of the California Board of Public Health," and that a copy be sent to the official journal of the California Medical Association.

Treatment of Tetanus.—Yodh briefly reviews 229 cases of tetanus, in the treatment of which antitoxin was used. Fourteen of these patients did not receive serum, of whom two with the disease in an extremely mild form recovered. The remaining cases were divided into two groups of 102 and 112. Patients in the group of 102 received an average dose of antitoxin of from 30,000 to 40,000 units intravenously and intramuscularly; 36 of these patients recovered and 66 died. In the group of 112 cases the antitoxin was administered intrathecally in the cisterna magna, as well as intravenously, intramuscularly, and subcutaneously; 59 patients recovered and 53 died. The author believes that the following facts have been established: (1) The use of tetanus antitoxin in the treatment of tetanus is perfectly rational, is absolutely necessary, and should be used early and in large doses. (2) The combined intrathecal (cistern puncture), intravenous and intramuscular method of administration is superior to all the others. It definitely lowers the mortality rate and ameliorates the symptoms far more than does treatment by the intravenous and intramuscular routes alone. (3) The administration of the antitoxin into the cisterna magna is preferable to the lumbar puncture, as the former is nearer the vital centers. This method quickly neutralizes any toxin that might be there and is much easier to perform. (4) The cistern puncture, properly performed, has no dangers. Not one fatality could be attributed to the administration of the antitoxin by that route directly in the group of 112 cases. If the needle is not pushed beyond 5.5 to 6 centimeters in adults there is no danger of puncturing the medulla. The author concludes that as the value of convalescent serum has been established in some infective conditions, it may be profitable to try its use in tetanus. Serum could be collected from convalescent patients and preserved for use in the place of the usual antitoxin.—*British Medical Journal.*

TWENTY-FIVE YEARS AGO*

EXCERPTS FROM OUR STATE MEDICAL JOURNAL

Vol. VI, No. 12, December, 1908

From Some Editorial Notes.

The End of the Year.—With this number your *Journal* ends the sixth year of its life. With this month, too, ends another year in the life of every one of us, for no matter when the birthday may come, we instinctively, as did the ancients, measure our years—that which man calls time—by the changes upon the great sun dial of nature. The six years that have passed have been very notable ones in American medical history. They have seen the reorganization of the entire medical profession of the United States. They have witnessed the growth and development of the American Medical Association to a point where it has become the largest and probably the most influential medical organization in the world. . . .

* * *

Hospital Abuses.—In his letter, Doctor Kreutzmann opens up the whole question of charity hospitals and hospital abuses. That there are always some people who will, and do, abuse every charity that has been or could be created, is well known. Every charity hospital that ever was run has at some time or other been abused by some people. . . .

From an article on "Opsonic Index and Vaccine Therapy" by Rene Bine, M. D., San Francisco.

For many years scientists have been trying to explain the phenomena of immunity. . . .

The object of this paper is to call attention to the results obtained by the use of bacterial vaccines, generally speaking, and to show why the technique of determining the opsonic index was destined, in its present form, to meet with disfavor.

Shasta County.

The Shasta County Medical Society met in regular quarterly session, with Dr. Thomas W. Huntington and Dr. Philip King Brown of San Francisco as guests. . . .

. . . Doctor Brown reviewed in a succinct manner the whole subject of goiter in its various forms and phases, using popular or technical terms as occasion demanded. He dwelt particularly upon the exophthalmic variety. He considered its treatment by the old-time remedies as useless or foolish; by the animal preparations as capricious and mostly disappointing; but he still had hopes in the newer serums. He maintained that surgical intervention offered the only assurance of relief. Doctor Huntington then spoke of the surgical treatment of exophthalmic goiter. . . .

Doctor Huntington's main object was to emphasize the importance of the conservation of the parathyroids, whose location, smallness, and independent blood supply placed them in jeopardy during the operation. . . .

* This column strives to mirror the work and aims of colleagues who bore the brunt of society work some twenty-five years ago. It is hoped that such presentation will be of interest to both old and new members.

Disease has been longer than any other of nature's forces misunderstood, fought against blindly, combated without real study. Scarcely seventy years ago did the first real glimmerings of what disease really is strike into the human mind in any practical way. Scarcely thirty years ago did the first real uses of that new knowledge begin to show themselves in remodeling human life.—H. W. Hill, M. D.

BOARD OF MEDICAL EXAMINERS OF THE STATE OF CALIFORNIA*

By CHARLES B. PINKHAM, M. D.
Secretary-Treasurer

Results of Board of Medical Examiners' Examination, Sacramento.—Charles B. Pinkham, secretary-treasurer of the Board of Medical Examiners of the State of California, reports results of the written examination held in Sacramento, October 17 to 19, 1933. The examination covered nine subjects, and included ninety questions for physician and surgeon applicants. An average of 75 per cent is required to pass. An allowance of 1 per cent added to the general average is granted by the Medical Practice Act for each year of medical practice under a license granted elsewhere than in California, provided the applicant has not fallen below 60 per cent in more than one subject.

Forty applicants wrote the examination.

Thirty-five graduates of medical schools (87.5 per cent) passed, and five (12.5 per cent) failed.

The following colleges were represented:

PASSED

College	Year of Graduation	Per Cent
Baylor	1933	81 4/9
College of Medical Evangelists	1933	83 1/9
		81 2/9; 87; 86 2/9; 85
Creighton	1933	85 8/9
		81 3/9
Georgetown	1933	83
George Washington University	1933	78 8/9
Harvard	1932	85 3/9
	1933	86 3/9
McGill	1932	85 7/9
	1933	90
Northwestern	1933	89 1/9
Rush	1933	87 8/9
	84 2/9 86 5/9; 85 2/9;	85 6/9
St. Louis University	1933	80 5/9
		80 6/9
Stanford	1933	84 8/9
		82 5/9
Temple	1932	78 6/9
	1933	85 1/9
Tulane	1932	80 2/9
University of California	1933	85
University of Charkov	1924	78 6/9
University of Illinois	1933	78 8/9
University of Michigan	1932	79 5/9
		88 3/9
University of Nebraska	1932	90 2/9
University of Pennsylvania	1930	81 7/9
Vanderbilt	1929	87 3/9

FAILED

Chicago Medical School	1927	66 8/9
Hahnemann of Philadelphia	1902	58 1/9
Loyola	1915	62 3/9
Psycho-Neurological Institute, Russia	1917	72 2/9
University of Illinois	1931	72 1/9

* * *

The list of successful applicants follows:

James Francis Brady, Alameda, University of California Medical School.

Max Brannan, Represa, Tulane University of Louisiana School of Medicine.

Lewis Thomas Bullock, San Francisco, University of Pennsylvania School of Medicine.

Francis Lester Crowley, Sacramento, Creighton University School of Medicine, Nebraska.

Dean James Darius, San Francisco, Creighton University School of Medicine, Nebraska.

Howard George Diesner, San Jose, University of Illinois College of Medicine.

Morton Spencer Havemann, Oakland, University of Michigan Medical School.

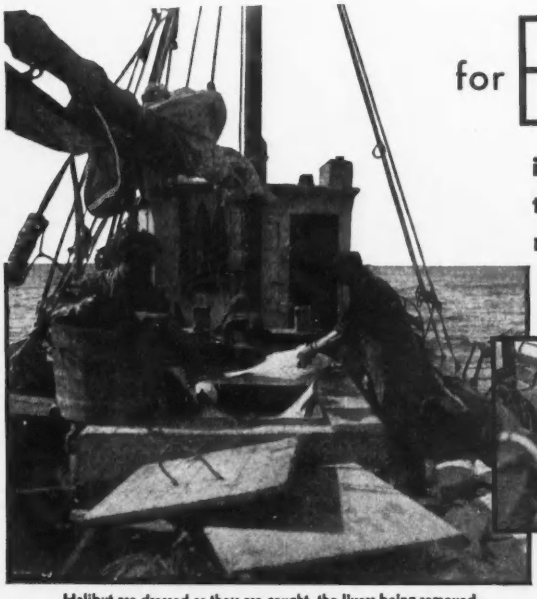
Rolla Burchard Hess, San Francisco, George Washington University Medical School, D. C.

* The office addresses of the California State Board of Medical Examiners are printed in the roster on advertising page 6.

(Continued on Page 17, Advertising Section)

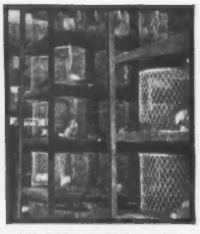
for Every patient

in your practice... the important Vitamins A and D without nausea or gastric distress



Halibut are dressed as they are caught, the livers being removed, cleaned and brought ashore packed in ice.

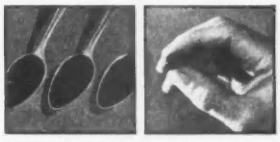
These fishermen don't "bring 'em back alive." Halibut are caught on lines at depths of three hundred to eighteen hundred feet, and die quickly being brought to the surface



All Abbott's Haliver Oil is bio-assayed before being released.

THE small average daily dosage—one or two capsules, or ten to twenty drops—of Abbott's Haliver Oil with Viosterol eliminates the difficulties of administration and the nausea and gastric distress which frequently follow the use of cod liver oil. By prescribing HALIVER OIL with VIOSTEROL and specifying ABBOTT, you can make certain that your patients always receive the original halibut liver oil preparation of which Abbott Laboratories were joint sponsors. You can be sure that the product is clear, golden yellow in color; is biologically standardized for Vitamins A and D content; has a negligible acidity; and that it will be sold to your patients, on prescription, at reasonable cost. Prescribe ABBOTT'S HALIVER OIL with VIOSTEROL 250 D for all conditions in which cod liver oil or Viosterol in Oil would customarily be indicated. Supplied in boxes of 25 and 100 capsules, and 5-cc. and 50-cc. bottles with special droppers.

HALIVER OIL PLAIN—Refined halibut liver oil, without Viosterol. 10 drops, contains not less than 5500 Vitamin A units, equivalent to at least 3 teaspoonfuls of cod liver oil.* Prescribe for Vitamin A deficiencies chiefly. Stocked by prescription pharmacies in 10-cc. vials with special droppers.



YESTERDAY

COD LIVER OIL —Daily doses of 3 or more teaspoonfuls. Disagreeable and difficult of administration. Frequently the cause of nausea and gastric distress.

TODAY

HALIVER OIL— One 3-min. capsule supplies at least as much Vitamin A as 3 teaspoonfuls of cod liver oil,* and as much antirachitic potency as 10 drops of Viosterol 250 D.

* Containing 400 U.S.P. units per gram.

ABBOTT'S

HALIVER OIL with VIOSTEROL 250 D

ABBOTT LABORATORIES, North Chicago, Illinois
Send FREE sample of Abbott's Haliver Oil with Viosterol to

Name _____ *M.D.*

Address _____

"No! He Insists on CUTTER Vaccine"

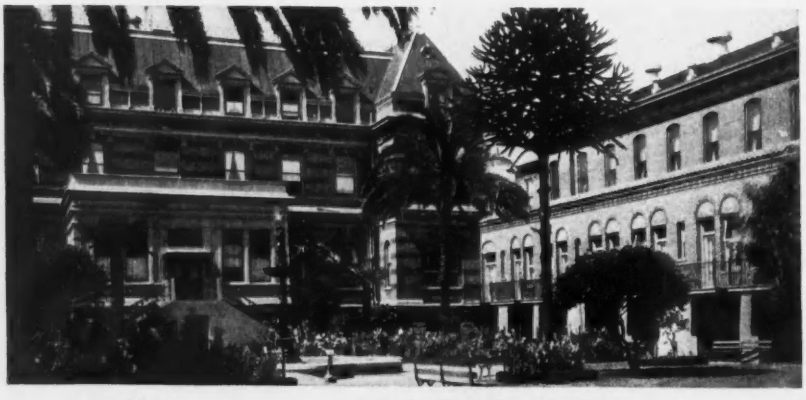
"OF course, they are all reputable houses; but the doctor says he gets better results with Cutter Products. He says that Cutter biologicals are produced from fresh cultures obtained from western sources, and are more specific for western use. Besides that, Cutter Products are fresher, as we are much closer to the source of supply . . . you'd better put in a good stock, because when he says 'Cutter,' he means 'CUTTER!'"

WHO IS SHE?
She's the assistant to nearly every physician who has made a clinical comparison between Cutter and other biological products.

FRENCH HOSPITAL • Geary Street and Fifth Avenue SAN FRANCISCO, CALIFORNIA

HENRI J. BAZERQUE, *President*
V. LABRUCHERIE, *Superintendent*

ALBERT AUBERT, *Secretary*
ELSIE E. MITCHELL, R. N., *Supt., School of Nursing*



A general hospital of 225 beds operating an accredited school of nursing, admitting all classes of patients except those suffering from mental diseases. Organized in 1851 and is operated by the French Mutual Benevolent Society, through a Board of Directors, a chief executive officer and staff. Accredited for intern training by the American Medical Association and approved by the American College of Surgeons

MEDICAL STAFF

Medicine
A. N. FREGEAU, M. D., Chief
E. S. KILGORE, M. D., Consultant in General Medicine
THOMAS G. INMAN, M. D., Consultant in Neuropsychiatry
MARX GERSTLE, JR., M. D., Consultant in Neurology
EDWARD D. CHIPMAN, M. D., Consultant in Dermatology
JAY JACOBS, M. D., Consultant in Dermatology
CABOT BROWN, M. D., Consultant in Lung Diseases

Urology
A. H. McNULTY, M. D.
ALVIN S. CERF, M. D.
SAMUEL A. GOLDMAN, M. D.

Radiology
LLOYD H. CROW, M. D.

Surgery
ASA W. COLLINS, M. D., F.A.C.S., Chief
HAROLD M. GILFILLAN, M. D., Assistant
CARL L. HOAG, M.D., F.A.C.S., Associate
E. B. TOWNE, M. D., Consultant in Neurological Surgery
EDMUND J. MORRISSEY, M. D., Consultant in Neurological Surgery
GEORGE WARREN PIERCE, M. D., Consultant in Plastic Surgery
W. L. ROGERS, M.D., Consultant in Lung Surgery

House-Visiting Department
COLEMAN A. BLOCK, M. D.
LOUIS D. RONCOVIERI, M. D.

Pediatrics
BRADFORD F. DEARING, M. D.

Anesthesia
HERMAN MARCUS, M. D., Chief
ELLIS D. HARMON, M. D.

Orthopedics
ALFRED RONCOVIERI, M. D.
FRANK A. LOWE, M. D.
RALPH SOTO-HALL, M. D., Consultant

Ophthalmology and Oto-Laryngology
E. C. FABRE-RAJOTTE, M.D., Chief
VICTOR D'ERCOLE, M. D., Assistant

Obstetrics and Gynecology
W. J. HAWKINS, M. D., F. A. C. S.
R. F. GRANT, M. D.
J. K. PLINCZ, M. D.
CHESTER L. COOLEY, M. D.

Pathology
MARIC..I H. LIPPMAN, M.D., Director Clinical and Pathological Laboratory
DAVID A. WOOD, M.D., Pathologist